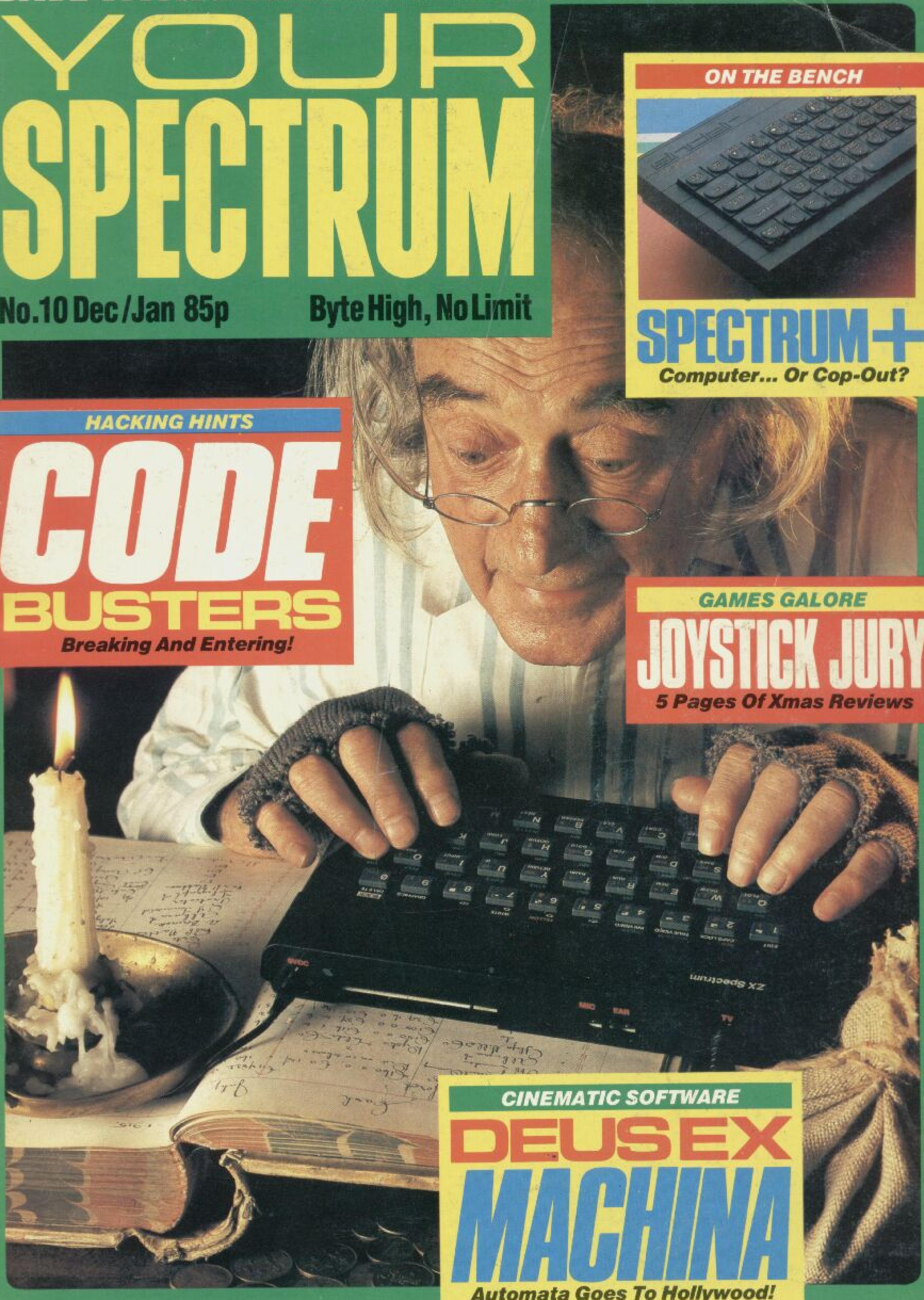
SAVE WITH SCROOGE: XMAS MEGABASIC OFFER!

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No.10 Dec/Jan 85p

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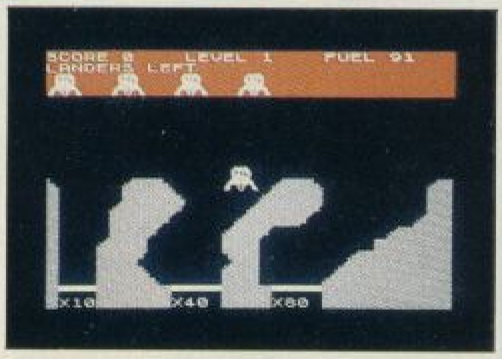
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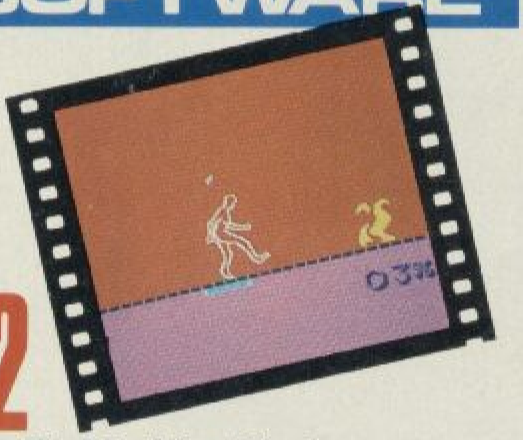


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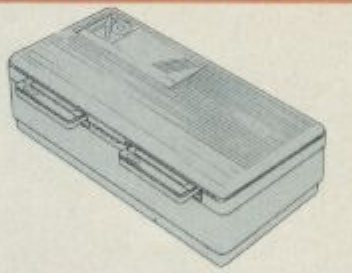
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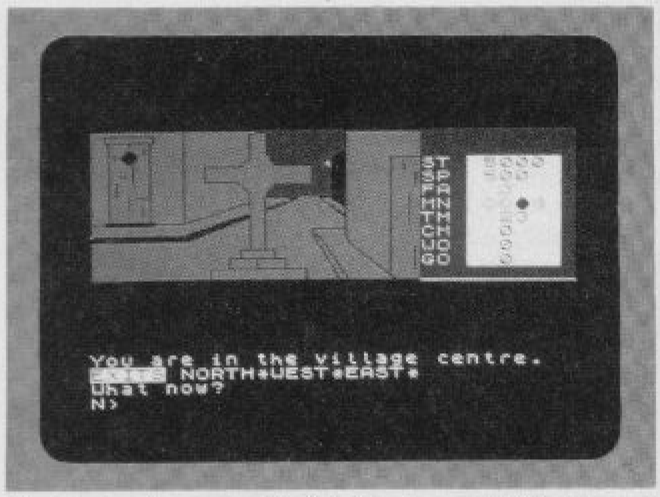
MASTERS OF THE THIRD WORLD

How long have you been waiting for *Wrath of Magra?* Well, kick those cobwebs away because, yes, it's finally arrived — courtesy of Mastertronic's new label, Mastervision. The only trouble is, it's bad news for all adventurers with shallow pockets ... for the price tag records an extravagant £12.50 — and not the £1.99 we know and love.

The Wrath of Magra manifests itself as a two-cassette package containing 120K of code as well as 158-page paperback crammed full of spooky spells.

Plans are currently in hand to make all three parts of the adventure available in one package, but there's no price tag as yet. But, further thrills, there's another part to the saga in the pipeline, the working title for which is *The Legacy of Light,* destined for a Spring launch.

If it's arcade stuff you're after, well, don't go complaining to Mastertonic (on 01-402 3316) — they'll only tell you about *See-Ka of Assiah* which is priced at £7.50 ... you see if they don't!



Mastertronics move into the big-time with *Wrath of Magra* — 120K of code for £12.50.

DOUBLE VISION AT THE HIPPO

Back in the Summer, *YS* held a competition in which readers were asked to prepare an animated software sequence which included the Hippodrome Logo.

The standard of programming was extremely high from all entrants, but two displays in particular stood out from the crowd — and, as Hippodrome owner Peter Stringfellow says, "They're as good as each other — and both are amazing!". So, in a sudden burst of generosity, Peter came up with the obvious solution — both entrants win the first prize.

The two luckly lads, **Graham Thorpe** of Kent and **Chi-Yeung Choy** of South Ruislip, are due a full years' membership to the Hippodrome, a weekend wallow at the Waldorf Hotel, a Champagne dinner at the Hippodrome (where they'll see the first showing of a video, made up from a combination of their entries) and, best of all, a free 12-month subscription to *Your Spectrum.* (*Give me the Champagne dinner anytime! Ed.*)

YS subscriptions are also due to all ten runners-up — **Neil Strudwick** of London; **Mr J Adams** of Wolverhampton; **Mr C Beckwith** of W Yorkshire; **Mr P Brown** of Norwich; **RJ Harvey** of Cheshire; **Daniel Harley** of Cheshire; **Matthew Carberey** of Lincoln; **John Strett** of Liverpool; **Mr Thorne** of Hartlepool and **Kevin Thompson** of Hammersmith. Congrats to each and everyone of you.





Two great winning Logos from our Hippodrome competition. That's Chi-Yeung Choy's at the top and Graham Thorpe's at the bottom.

ONE OVER THE EIGHT

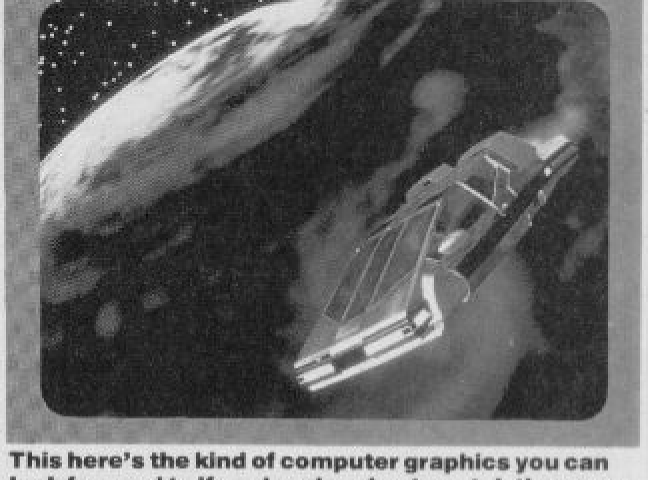


Four of Activision's new releases ... and *Ghostbusters* is on its way for Xmas!

Activision has launched eight cassettes for the Spectrum and plans in addition to bring out *Ghostbusters* just before Christmas.

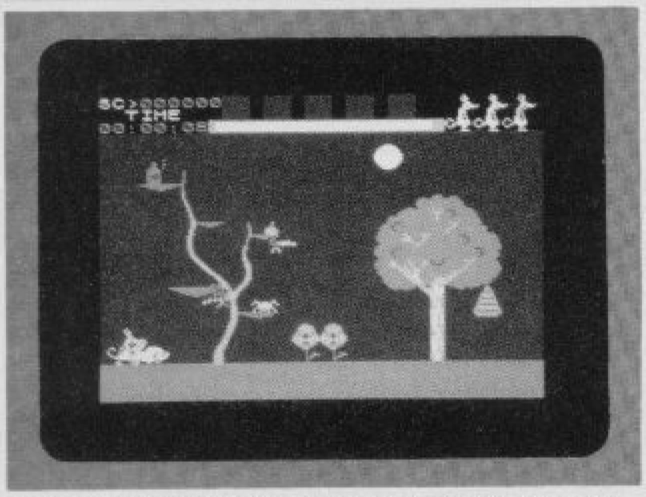
The line-up reveals *Beamrider, Enduro, H.E.R.O, Pitfall II, River Raid, Space Shuttle, ZENJI* and *The Designer's Pencil.* All will retail at £7.99, except *Pitfall II* (£8.99) and *The Designer's Pencil* (£9.99).

Those of you who attended the PCW Show earlier this year will perhaps understand the natural reservations we have about the forthcoming Christmas release. Activision had a stand opposite our's at the show and was playing the *Ghostbusters* single non-stop throughout the whole five days. We reckon we suffered, in total, over 2000 renditions!



This here's the kind of computer graphics you can look forward to if you're planning to catch the new film, *The Last Starfighter*. For some reason the film-makers chose to use the Cray X-MP instead of the Spectrum (*They must be crazy. Ed.*) and the movie claims graphic scenes that way outdo *Tron*.
(Reproduced by kind permission of Digital Productions, Digital Scene Simulation (sm), Los Angeles, CA. (c) 1984. All rights reserved.)

WANGLING A FURT



Jungle japes with Jasper — find out what happens once the Furt has been wangled!

Micromega has just released a new game called *Jasper* — a nifty little number that mixes Furts with flowers, potions, brollies and killer bunnies.

Confused? So you should be!

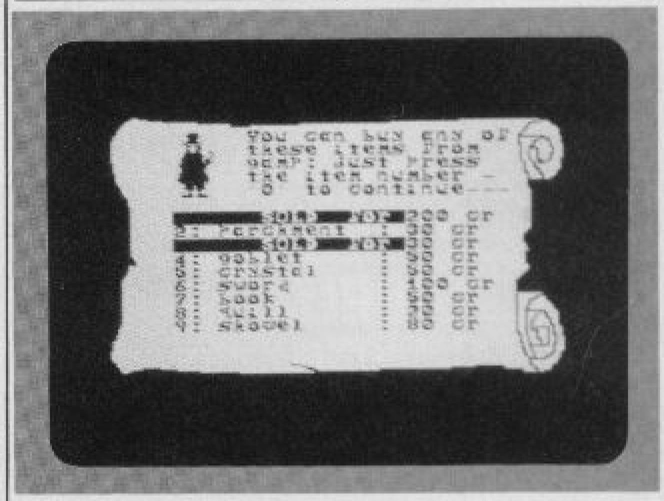
Apparently the lucky player lands the role of a jungle rat called Jasper, making his way through his native land just after the Furt has wangled.

Written by Derek Brewster (author of *Codename Mat* and just-released *Kentilla*), the game seems to have some loose connections with *Alice in Wonderland*. The mysterious Furt has just done its wangling and poor old you have to follow a killer bunny that's armed only with a total lack of resolve as you search for safety.

In fact, *Jasper* is another one of those platform-type games, giving the benefit of no fewer than 22 screens; it also employs the strategy elements of an adventure game.

You can obtain your Furts from Micromega for a mere £6.95.

WINNING AND LOSING



This year's Cambridge Award winner — *The Prince*.

The Cambridge Award winners have been announced, prizes presented and CCS has several new games into the bargain.

The competition was won this year by *The Prince*, 'penned' by John Sherry of Keele.

Anyway CCS is retailing *The Prince* at £7.95 and the four runner-up tapes — *1942 Mission, Insurgency, Blue Riband*, and *War Zone* — all at the conventional £5.95.

HACKING AWAY



HUNT EMERSON

Andrew Pennell peruses the POKEs. Write to him at Hacking Away, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

First up, thanks for the terrific response to my appeal for information — the result has been quite amazing. As usual, the letters divide into two groups — the 'haves', who wish to divulge information, and the 'have nots' who want it.

As promised last month, here's a bit of info about *Chuckie Egg* which (by the way) is probably the best game A 'n' F has ever produced. It's quite old now and doesn't work with the Kempston joystick. Other joysicks (for example, Interface 2) are OK as it uses definable keys; it can, however, be suitably modified. But before that, let's reveal the most important POKE ... for infinite lives. When I originally hacked *Chuckie Egg* (actually before it was released) I didn't even look for infinite lives—. which goes to show how long ago it must have been! Luckily I kept my notes and recently had another go at it, with the help of a letter from **Graham Hutton**.

The first thing to do is to load the bytes, which is not very straightforward because of the protection method it uses. I don't want to step on anyone's toes, so I'm not going to supply a special loader; I'll use instead a modified version of the loader in the game. To begin with, enter the multiple line (do a NEW first if you have Interface 1 attached):

```
MERGE "":POKE 24501, 195:GO TO 1
```

Then play the tape. It'll load as normal, but will return to Basic when finished. At this stage, if any error occurs, the machine will fall over — so be careful what you type. For infinite lives enter:

```
POKE 42837,0: RANDOMIZE USR 42000
```

And the game should start. It's not the most efficient way of doing the job, but it does work. Instead of removing a DEC(HL) or DEC(IX+n), it changes a jump instruction, and this has the effect of printing the 'Game Over' message a couple of times during the game ... but don't let that put you off.

Now for the joystick mod. Having reset the Speccy, enter the listing given and save it on tape with LINE 1000 (don't save it to Microdrive or you'll get into all sorts of problems). Then load *Chuckie Egg* in the way described above and do the POKE on its own if you want it. Next, load the joystick mod and, hey presto — a joystick *Chuckie Egg*! As before, if any error occurs during the loading of the second listing, the machine will fall over and you'll have to start from scratch.

I also got a letter from someone who wishes to be known as **'ITR'**, who said that he or she knew the infinite lives POKE for *Chuckie Egg* but wouldn't condescend to tell me what it was — we don't need your type round here! Actually, ITR did come up with some interesting stuff on the way the screens are stored. Apparently they're stored from 46000 to 51372, each taking 672 bytes. The letter went on to supply a neat little program that fills in all the holes at the bottom of the screens:

```
500 FOR f=46000 TO 51372 STEP
    672
510 FOR g=0 TO 31
520 POKE f+g,5
530 NEXT g
540 NEXT f
560 RANDOMIZE USR 42000
```

Enter this in the same way as the joystick patch, by saving it to tape. In fact, I think these POKEs are better than infinite lives; the game still remains difficult, though easier than the standard version.

I've also received several requests about putting *Sabre Wulf* on Microdrive — apparently even Ultimate has said it's impossible. Shame on you Ultimate! Considering it costs a tenner, you should be more helpful than that. I never use cassettes except for loading originals before converting them, and switching *SW* is pretty simple — details on that next month.

Until then, keep hacking and sending your letters in (though please no more *JSW* POKEs — I've enough letters on that subject to wallpaper my bedroom!).

```
1000 DATA 39277,103,39321,71,40311,71,40893,71,39
341,79,40254,79,40850,79,40655,95,40713,40713,87
1010 RESTORE 1000
1020 FOR i=1 TO 9: READ a,b
1030 POKE a,219: POKE a+1,223: POKE a+2,0: POKE a
+3,0: POKE a+4,203: POKE a+5,b
1040 NEXT i
1100 RANDOMIZE USR 42000
```

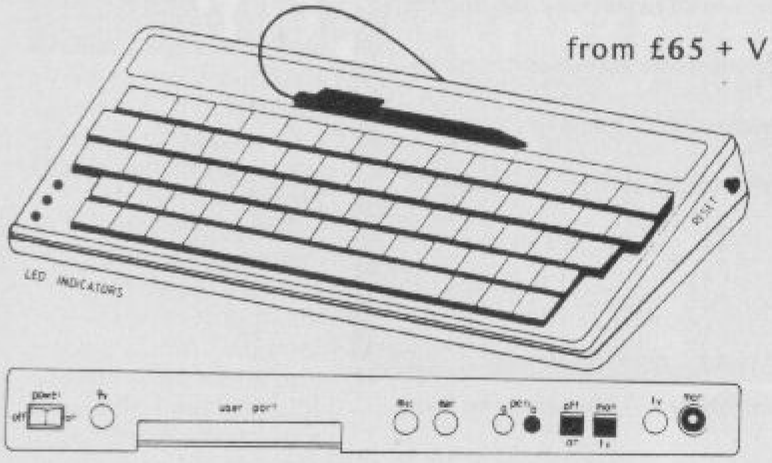
The Basic listing providing a joystick mod for *Chuckie Egg*.

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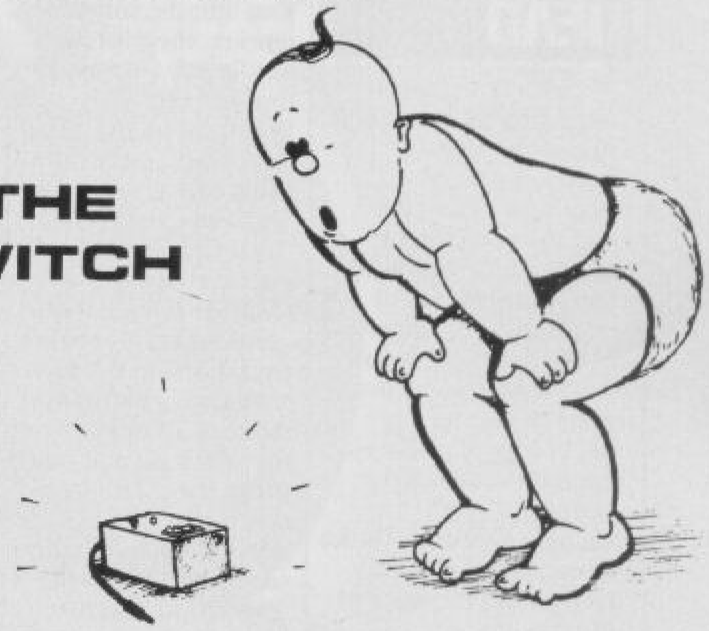
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BRING OUT YOUR DEAD

Judging by the number of times we at *Your Spectrum* hear of Spectrums byting the dust, the new 'Micro Repair Club' sounds like a very good idea. For your yearly enrolment fee of £24.95 (obviously they've done some heavy research into the psychology of pricing), you get an extended warranty; if your machine ever does choke on its chips, it can be fixed within the week at no extra charge.

Said Micro Repair Club's general manager, Simon Jamison, "The club is offering a service that has been needed in the home computer market for a long time.

"Now users will know that if their computer breaks down after the initial manufacturer's warranty has run out, they can still protect their investment by joining the club."

The MRC is also offering a reduced price to schools, which understandably have more computers than your average user — but not necessarily a huge budget to spend on them.

Once you've paid your initial membership fee you can renew it indefinitely at a reduced £14.95 a year. On the other hand, you could start off with a cost-effective four-year plan at £57.95. Mind you, with a Spectrum, you get a year's guarantee anyway. So add another four years on that and it doesn't take a mathematical genius to work out that you have a Spectrum that will keep working — perhaps through the odd patch-up job — for five years! Five years ago there wasn't even such a thing as the ZX80, so who knows what'll be around in the next five?

More details on Speccy rescusitation on 01-946 7777.

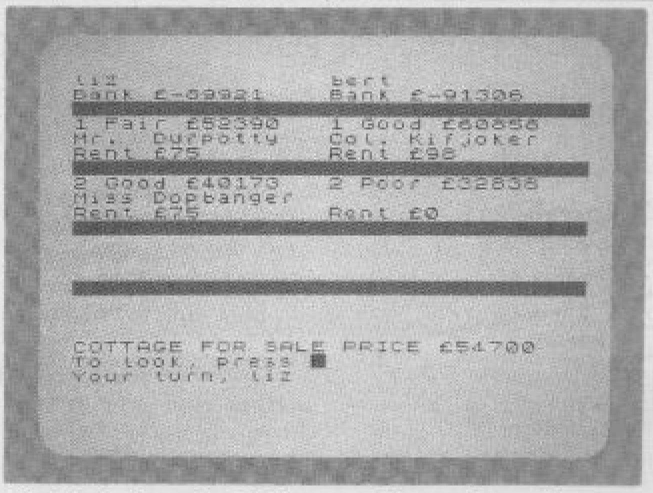
STERLING STUFF?

It's not exactly rare these days to see book publishers dipping their toes into the software market, therefore it's hardly any surprise to find Sterling Publications sprouting forth the dynamically titled division, Sterling Software.

The new company's got two packages due for October release, both aimed at the Spectrum user. First up is *Country Cottages*, a two-player strategy affair involving the purchase and sale of properties ... a sort of down-market *Monopoly*. In the usual struggle to outdo the opposition, Sterling claim that the game contains "an infinite number of different graphic views"!

The other title is called *Assignment East Berlin* — which sounds a bit like *James Bond meets his Funeral In Berlin*, except that in its infinite wisdom, Sterling has named the lead character 'Ice Man'. Hmm? Still, old traditions never die ... just as you know Bond can't cop it in his new film (because they've already started making another), you'll be pleased to know that Sterling has already got its man of ice earmarked to star in *Assignment Hong Kong* in the future.

Both titles will be on sale for £5.95, and if you want to find out where Ice Man's going after Hong Kong give 'em a bell on 01-258 0066.



Sterling's Country Cottages — *Monopoly* on the cheap?

OCEAN SPLASHES OUT!

Final negotiations have just been completed between the liquidator of poor old Imagine, and Ocean Software.

Not only has the company bought exclusive rights to a major portion of Imagine's assets, but it's also got its mitts on the Imagine name and logo. Says David Ward, Ocean director, "We now have sole rights to use the Imagine name".

Ocean has also re-employed eight of the ex-Imagine programming team to work on the development of program concepts, in particular a new animated strategy adventure to be released sometime in November.

FROM THE HIP



Troubleshootin' Pete Reporting

Pete's phone lines are open from 10 am-1 pm and 2-5 pm on Wednesdays and Fridays. Ring him on 01-631 1433.

One call out of this month's pack came from Mrs Frome of Staines in Middlesex. She said she'd seen our news item in the last issue about the BBC and Basicode, but that she didn't actually know what Basicode was. Would it work with her Spectrum?

Basicode is, as I see it, a way of making the various versions of Basic, and the individual loading systems of machines, compatible with each other. There are 10 machines that I know have Basicode at the moment, and that list *does* include the ZX Spectrum.

It actually works by having a minimal 42 statements which can be used in a program; any other commands — that is the ones which change from machine to machine — are kept in subroutines. Under Basicode, all programs start from line 1000 because lines 0-999 are reserved for Basicode's standard subroutines. For example, if in your Basicode program you want to clear the screen, you have to say GOSUB 100.

Basicode isn't perfect though. The makers have assumed, for instance, that your machine supports two-letter string names and have the 'standard' LEFT$, RIGHT$ and MID$ string slicing techniques — which the Spectrum doesn't. Fortunately, they've found a way around it.

Anyway, the BBC continues to do its Basicode broadcasts on Sunday mornings at an unearthly hour. If you want more details I believe you can get Basicode for the Spectrum from the BBC itself, by writing to Chip Shop, Broadcasting House, Portland Place, London W1.

■ Now, a small point for all callers who have found that their Speccy's have cremated themselves out of the guarantee period. Read the piece in *Frontlines* about the Micro Repair Club, because apparently you can get hardware fixed by them — even if you're not a member — for quite a lot less than it would normally cost. The company uses Thorn EMI to fix the dead machines, so check 'em out.

■ Lastly for this month, I'll tell you a bit about the stuff I've been doing for London's Capital Radio recently. Bubbly DJ, Kelly Temple (who runs the kid's program *XYZ*) has started a ComputerWorld spot. Maybe for my youthful looks — or could it be because he was desperate (*You got it. Ed.*) — he has taken me in to look after it.

Anyone in London who's after a good laugh can hear me every week stumbling over my words on Sundays at 3pm. If you're 16 or under, you can join in the competitions to win an Amstrad (*That's blasphemy! Ed.*) and we're starting a series to teach you Basic. If you're not in the Capital listening area, get in touch with your local radio station and start one up. It's worth a try!

Catch you on the 'phones ...

Troubleshootin' Pete

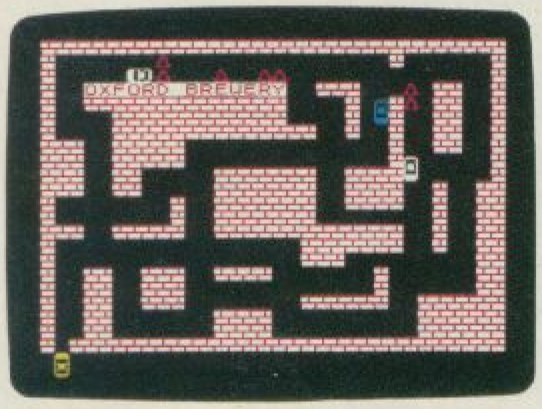

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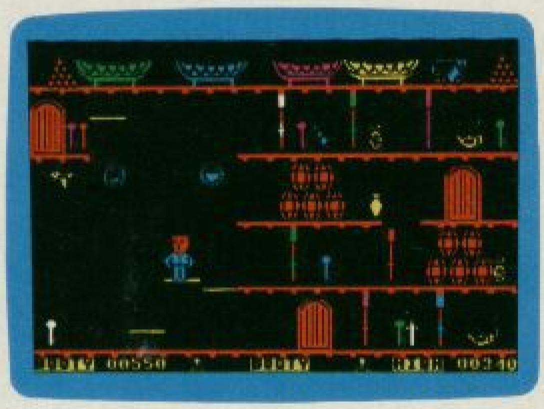
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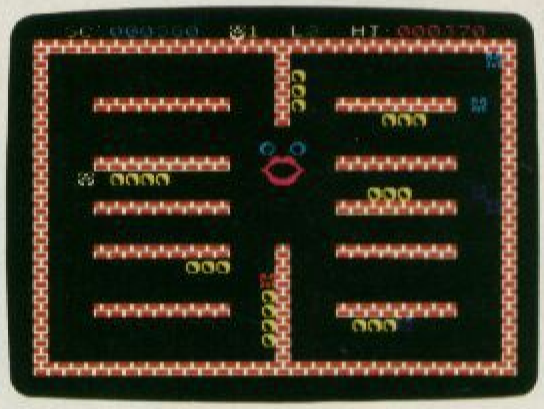
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RUN BABY RUN is a demanding cop chase around five derelict locations. You, the getaway driver must dispose of six pursuing police cars and elude the seventh car's fire power to make good your escape. It's not as easy as it sounds…

BOOTY

Well shiver me timbers and splice the mainbrace and pass the grog, me hearties. Here be the greatest pirate adventure of them all, aboard that scourge of the Seven Seas – the dreaded Black Galleon. Feast yer eyes on the BOOTY-ful treasure stored in 20 holds. There be pirates, parrots and fun galore. If you don't like it, matey, we'll hang you by the highest yard-arm!!!

CRAZY CAVERNS

Ten Crazy Caverns, ten hungry mouths to feed. Line up the Crunchy Cubes and cannon them into the Craving Craw. Watch out for the Crazy Crashers coming to convert your little Cubey Crammer into a Crushed Crisp. It's a cracker!

Look out for these games in the FIREBIRD silver range at selected high street stores.

SPECTRUM: THE WILD BUNCH · BOOTY · MR. FREEZE · TERRA FORCE · VIKING RAIDERS · MENACE · EXODUS · RUN BABY RUN · CRAZY CAVERNS.

COMMODORE 64: BOOTY · MR. FREEZE · EXODUS · HEADACHE · ZULU.

VIC 20: SNAKE BITE · MICKEY THE BRICKY.

BBC MICRO B: BIRD STRIKE · GOLD DIGGER · ACID DROPS · DUCK!

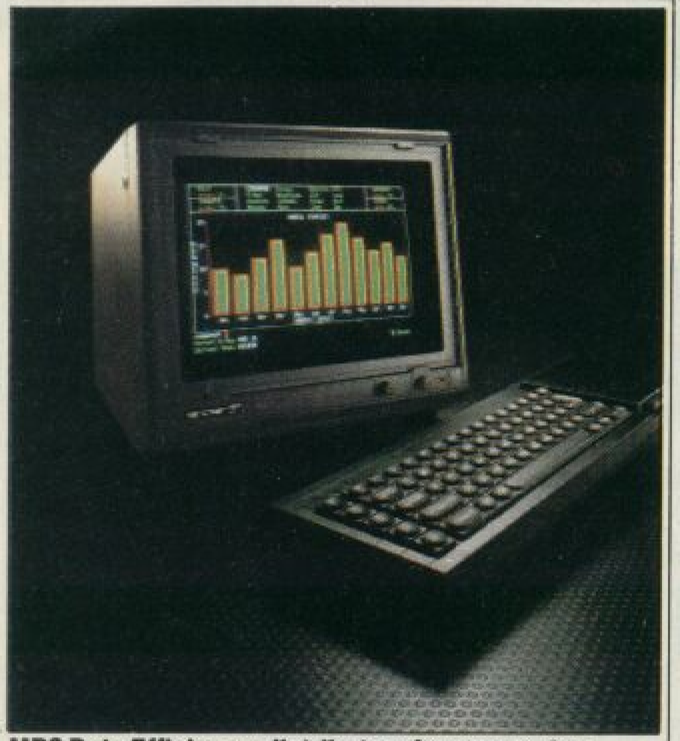


FIREBIRD

SOFTWARE

The new range from British Telecom. You'd better believe it!!!

FIREBIRD SOFTWARE, WELLINGTON HOUSE, UPPER ST. MARTIN'S LANE, LONDON WC2H 9DL. TEL: 01-379 6755/5626



MBS Data Efficiency, distributors for companies like Brother, Epson and BASF, has just announced a contract with Sinclair Research for a beast called the Sinclair Vision QL Monitor. Developed jointly by Sinclair Research and MBS for exclusive use by the QL, it's a 12" RGB colour monitor and has the latest 'blackface' non-glare tube for better colour contrast. Needless to say (yawn) the casing is designed to complement the delightful lines and nifty colour of the QL. The price for this Sinclair Research authenticated piece of equipment is £299 (including VAT) and comes with a 12-month warranty.

IF YOU CAN'T BEAT 'EM ...

Bug-Byte, CBS, Quicksilva and Virgin Games have joined forces to set up a sales service to sell all of their collective software, as from 1st October 1984.

The operation is jointly controlled by the four companies involved, and an extra person in the guise of Geoff Thompson has joined to become national sales manager.

The Software Sales Service, as it's called, plans to move the simple selling of software into a more dynamic dimension, using marketing aids, distribution networks and promotional material. We'll be able to pop in and see how they're getting on — because the new service is based just down the road from the *YS* towerblock — at 3-5 Rathbone Place, London W1.



Quicksilva's MD Rod Cousens.

CHILD'S PLAY

Described in the blurb as a 'totally new experience for the very young', *The Magic Sword* is an adventure program that comes complete with a 48-page booklet to help set the fairytale scene.

Priced at £8.95, the action sets the micro toddler in 'the magical world of a handsome prince, a beautiful princess and a castle ...' The idea of the game is to pick up lumps of magic until you've enough to finish the story.

Childish information can be obtained from Database Communications on 061-456 8383.



The Magic Sword — read all about it!



Akai is introducing its first television set to be sold on the UK market. But it's a TV with a difference, because of the RGB and Video inputs that come out of its rear end. Apart from these functions — which will obviously interest the home computer user — it also has another 14 channels for ordinary telly programs and VCR enthusiasts. How much for this piece of electronic wizardry? Only £279 to you! OK John?

SOUND SOFTWARE

As you well know, creating sound effects independently of the BEEP command usually means shelling out about £30 for an add-on synthesiser chip. But now it seems you can get some surprisingly good sound effects under software control for a fraction of that.

For a mere £7.95 (including postage and packing) you can get your mitts on *Spectrum Sound Effects* — a program that gives you 50 different pre-programmed machine code effects which, by varying both the pitch and duration, provides 2000 sounds in all. They can all be played through the Spectrum's keyboard, plotted with a graph on the screen and saved independently of the main program — so you can use them in your own creations!

Sound Effects is available from MFM Data Services Ltd, 141a Camden Road, Tunbridge Wells, Kent TN1 2RA.



Hardware company, TEC, has just released an ON/OFF switch for the Spectrum priced at £4.95. Although that may seem a little pricey for something so simple, it's actually quite a good design and doesn't look at all out of place attached to the Speccy. If you want one, TEC is at 24 Victoria Road, Bromsgrove, Worcs.

DJ FIGHTS BACK

A cheque for £2100 was presented to proud Radio Luxembourg disc jockey Stuart Henry, which will be used to fight the crippling disease Multiple Sclerosis. The cash had been raised by Bellflower Software and WH Smiths from sales of the Spectrum game *Stuart Henry's Pop Quiz*, which was launched earlier this Summer.

An MS sufferer himself, Stuart Henry said, "Everyone who's bought the program so far has made a contribution to vital research into finding a cure for MS". And if you haven't rushed out and bought one already or you just don't like music ... well, that's not good enough! Why not send a donation to the MS Society anyway — it's an impeccable cause! You can ring the society on 01-381 4022.

CONCURRENT QL AFFAIRS

John Torofex and Nigel Cross investigate the QL news scene.

Well, Sinclair Research has finally announced that the QL mail order operation is being wound down, and QLs are making their presence felt in the high street stores.

However, there are all sorts of rumours around which suggest there's still the odd reliability problem with many of the machines. The manager of the local branch of Dixons told me that out of 1000 machines delivered to their warehouse, only 190 worked properly. Further rumbles from distributors Spectrum, seem to indicate similar troubles — with one hapless dealer spending a whole morning with six QLs and six sets of Psion software, trying to find a combination that enabled all the Psion wares to be loaded.

DIY RAM?

Has anyone out there seen the ad for the 256K RAM expansion module from Simplex Data Ltd? Is it my failing sight, or does close inspection of said photographed device reveal the alleged unit to be constructed from four separate components — three pieces of chopped-up QL PCB and a DIN 41612 connector — all held together with black sticky tape!

What beats me is how the company can sell the board at £198, when each QL that's chopped up will have cost over £300 at trade prices!

RESPONSE FRAME

In a recent communiqué with Dr David Potter of Psion, he claims that an analysis of how the company are dealing with QL enquiries over the period June 6th to October 10th gave the following results: 65 per cent were answered and posted on the same day as receipt; 15 per cent were dealt with within 48 hours of receipt; and eight per cent were sorted within 24 hours.

My more astute readers will note that the above leaves 12 per cent out in the cold. It seems these are the 'tricky' questions, involving printers and the like, that need much more research. Nice one,Psion!

EXTRA, EXTRA!

Fans of QLUB (*Wake up out there! Ed.*) who've been on the edge of their seats waiting for the second thrilling instalment of *QLUB News* will have not have to hold their breath much longer. However, according to my calculations, as the first QLs appeared in April, surely we should have seen at least four issues by now? Maybe the editor's too busy sifting through the wealth of programming contributions to put together the next issue.

SIR CLIVE WHO?

A rather interesting journal fell on to my desk this month, the *Quarterly Newsletter of the Society for the Study of Artificial Intelligence...* and it details the exploits of one, Sir Clive Hardware. He reminds me of someone.

A SERIAL SOAP OPERA

It appears that the QL has all sorts of problems in its serial ports. As the serial I/O ports require to be set at the same baud rates, it's been assumed by many that the machine has these two sockets 'ganged' together in some way through their internal wiring. Take the recent experience of a QL user.

Picture a QL (JM version) with Sinclair-provided serial I/O cables, an Epson RX80 printer performing perfectly at 9600 baud using its XON/XOFF protocol and an Apple II using a proprietary serial card at 1200 baud (with the RTS and DTS signals shorted together to fulfill the requirements of the Apple transmission). However, connect the printer to the QL's ser1 port (and switch it on) and the Apple to the ser2, and type the following on the QL:

```
BAUD 1200
COPY SER2 TO SCR
```

All you'd expect is the QL to display any transmission from the Apple. However, without transmitting any data from the Apple, characters appeared on the screen!

If you remove the Apple there's no difference, even though there's nothing attached to ser2 where the Apple was once attached and from where the QL is supposed to be getting its information. If you disconnect the printer at this point, no more characters appear on the screen. If you then reconnect the Apple to ser2, you'll get perfect results.

The moral of this sad story is that QL users won't be able to 'mix and match' disparate pieces of equipment through the serial ports, as spurious characters are most likely to interfere with their work! Also, it seems as though the QL serial ports are so wired that it is *impossible* to continue working in a 'reasonable fashion' (according to the QL's documentation!) without disconnecting other pieces of equipment. Which, when you think about it, is not a very satisfactory situation!

Nigel Cross

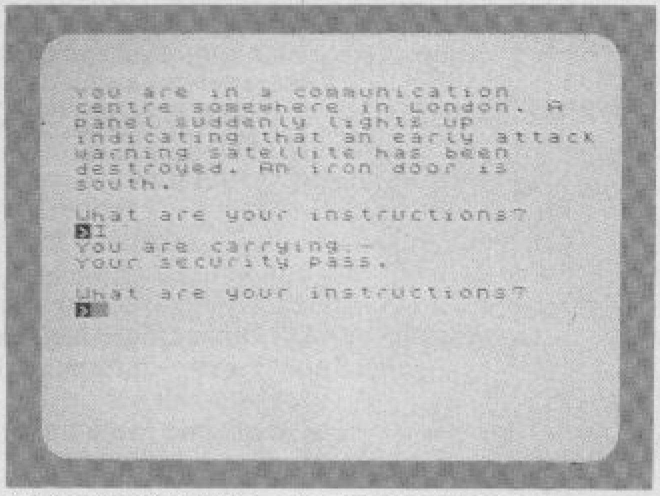
AND ON THE 8TH DAY...

Yet another Liverpudlian software house has just programmed itself into existence. Called 8th Day Software, the company's opening its range with six text adventures, ranging in difficulty from beginner's stuff to 'jolly difficult'.

All have a low price of £1.75, but 8th Day is quick to disclaim the 'you-get-what-you-pay-for' syndrome.

The six new titles, all launched under the 'Games Without Frontiers' banner, are all *Quill*ed adventures and your measly £1.75 even includes postage, packing and VAT. How they can do it at such a low price and still make a profit defeats us.

Unwrapping the first six packages, we have *Four Minutes to Midnight* (an advanced strategy adventure), *Cuddles* (a moderately difficult adventure for 'big' kids), *Quann Tulla* (a science fiction adventure), *Ice Station Zero* (a beginner's crime solving adventure), *In Search of Angels* (another crime adventure) and *Faerie* (an advanced fantasy adventure). All the games can be ordered direct from 8th Day Software, so give them a ring on 051-677 1581.



In Search of Angels — one of six packages all priced at £1.75!

DOWN IN THE DUNGEON

PSS seems to be getting more than enthusiastic about its latest release, *Swords & Sorcery*. The company now claims that it's the best reproduction of the role playing idea on a computer yet; it's true there's been nothing *completely* true to the original concept of *Dungeon & Dragons* to date.

Written using an odd system called MIDAS (whatever that might be) the program is a 3D graphic animation, simulating the effect you get with Video Disk games.

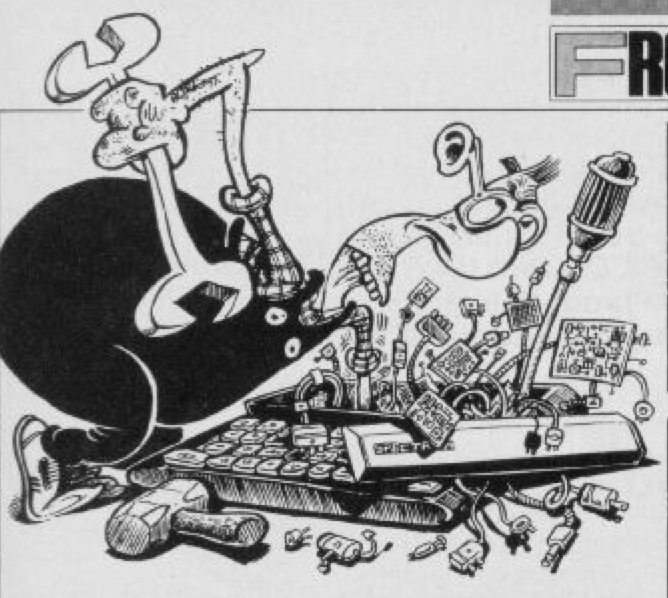
The colour leaflet that PSS is currently putting about makes *Sword & Sorcery* sound like nothing on earth. Either it's got a very good public relations department, or it *is* like nothing on earth.

The fact that the game sticks very close to the gripping role playing



idea makes this program kind of special. If it's got the graphics it claims to have, then it's no wonder PSS is screaming about it.

More enlightment on 0203 667556.



HUNT EMERSON

HARD CORE

Our hardware hacker, Trevor Marchant, is here to help you rescusitate your Spectrum equipment. Write to him at* Your Spectrum, *14 Rathbone Place, London W1P 1DE.

Welcome to the Spectrum graveyard. If you're having any hardware problems with the Spectrum, Interface 1, Interface 2, Microdrives or any other peripherals, I'm here to offer advice. Needless to say, I can only do so much ... so if your equipment has disappeared in a puff of blue smoke, your best bet is to contact Sinclair Research on 0223 353204 (Cambridge general enquiries) or 0276 685311 (Camberley customer services).

What I'll need from you is a *detailed* description of your problem — obviously the more information you can provide, the better equipped I'll be to answer your query; please *don't* send your broken Speccys to me — with the best will in the world I can't manage any on-the-spot repairs!

Also, I'm looking to compile a list of reputable repair companies. Anyone who's managed to fix your computer in record time is worthy of mention, so write to me with their names and addresses and I'll then be able to offer any readers advice on where to send their equipment once it's bitten the dust. While I'm on the subject, you may be interested to know that Sinclair Research is setting up a nationwide repair service with Verran (UK) — for more details of the new Computerfix service, dial 0276 66266.

So, remember, when your machine dies on you, you've got a friend. I may not be able to fix your equipment for you, but I might be able to tell you exactly what's wrong with it and who'll be the best to sort you out.

CHEAP STUNTS DEPT.



Praise *Kokotoni Wilf* and meet Lee Majors? Yuck!

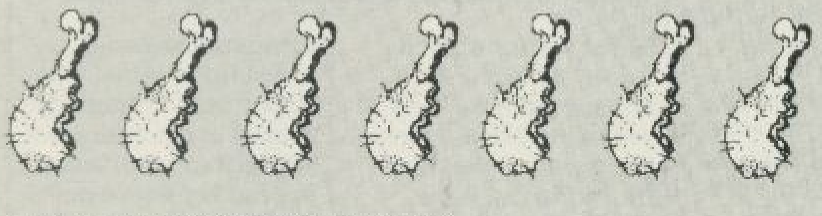
Elite Systems offered a copy of *Fall Guy* to anyone who could crack *Kokotoni Wilf* and send the company details of the hidden message. Entrants to the competition receive copies of Elite's new game in November but the accompanying letter gave the winners yet another competition to enter. To quote: "We're offering the first five *Kokotoni Wilf* fans, who get a letter printed in a computer magazine *praising* the game, the opportunity to meet Lee Majors ... but remember, we must see your letter in print before we can declare you a winner".

Hah! 'Tis but a pretty cheap publicity stunt! By the way, we got hold of a copy of Elite's letter from a winner who got the hidden message because the game failed to load properly — the message was given up within 30 seconds.

YOUR SPECTRUM TOP TURKEYS

You said it, not us! Yes, it's the time of the year when all good men and true POKE around the depths of their souls — to dredge up their considered contribution to the poll that signals all that's worst in commercial games software.

Funny thing is some of them also get voted as the best! (*Well I never! Ed.*) Still here are the Turkeys in descending order of nastiness — culminating, of course, with this year's winner of the coveted *Your Spectrum* Strangled Turkey Awards for 1984.



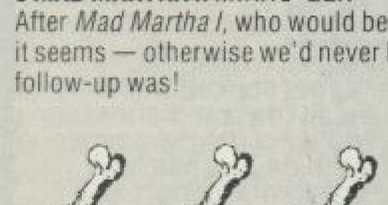
1 JET SET WILLY SOFTWARE PROJECTS
Hey ... how come this is top of the best sellers *and* bottom of the dogs? Is there sneaky work afoot? Perhaps it was just the publicity overkill ..., And no, I haven't got any more POKEs for chrissake!



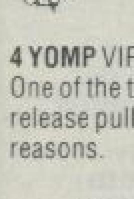
2 TRANSYLVANIAN TOWER RICHARD SHEPHERD SOFTWARE
Here it is again — skimmed off the top of last year's poll and pipped only by *JSW*. Looks like some people *never* forgive and forget.



3 MAD MARTHA II MIKRO-GEN
After *Mad Martha I*, who would be man enough to sample *MMII*? A few it seems — otherwise we'd never have known just how awful the follow-up was!



4 YOMP VIRGIN GAMES
One of the true low points of 1983 disinterest. Still this early Virgin release pulls in the negative votes — with the most impeccable reasons.



5 SCHIZOIDS IMAGINE SOFTWARE
If you weren't already before you started, then schizoid you're likely to be before you're finished — if you can stay awake that long. Let's hope it's one that Imagine's receiver *isn't* able to flog off in the forseeable future.

Good, bad and indifferent . . . as usual us gamesters got an across-the-board sprinkling in 1984. *Old Nick* takes a three-pronged look at the seamier side of it all.

If there's one thing you can say about the games software released in 1984 — it's that the quality overall has been higher than in 1983. That's not to say, of course, that there haven't been the usual crop of misfires. Take A 'n' F Software's *Dashing Dougie*, for instance. The copious pages of advertising early in the year suggested a mega-bombshell was on the way — then, nothing. The ads stoped and A 'n' F quietly forgot about it. Perhaps the game was so awful it never reached the duplication stage. Certainly whispers went around that the software changed programmers towards the end of its aborted life; was the first programmer making a pig's ear of it? Or was it just that the second programmer was unfamiliar with the particular coding techniques of the first? It looks like we'll never know.

Biggest teeth-gnash of the year for me has been the latest 'megadventure' program, *Eureka*. On the whole it's pretty good, but — and that's a *big* but — the arcade games that you *have* to play to get into the adventure can be summed up in one unprintable word. Pass the POKEs, Gladys.

Those unkind enough to want to present companies with Turkey Awards for knocking out consistently bad programming may look no further than Virgin Games. On the other hand, VG has just gone and ruined everything by switching strategy and actually buying the rights to some decent stuff! K-TEL, however, is still riding high on its lowliness ... I haven't seen a good game from that direction so far. 'Two-for-one' sounds OK, providing somewhere down the line you're getting value for money. Sidney Snide says the programs we list in *YS* are far better than the wee packs K-TEL send us for review ... of course, I wouldn't dare say such a thing myself.

So, on we go to '85. It might be nice to predict that we've seen the last of the turkey droppings and that next year, all will be fascination and excitement on the software shelf. The trouble is, should such an awesome dream gain fulfillment, what am I going to write about next year?

THE ULTIMATE EXPERIENCE

Ultimate Play The Game should have released the first of its two MegaGames by the time your eyes light upon this page.

The package you can buy now — if you believe the PR person — is the follow-up to *Sabre Wulf*.

So, here we go — welcome to *UnderWurld*, the evergreen lair of the Wulf.

The other game — *KnightLore* — should be released by the end of this month, but Ultimate's not saying much about what the game involves.

Both games are going to be retailed at £9.95, but they really should be worth it — honest!

BT GOES SOFT

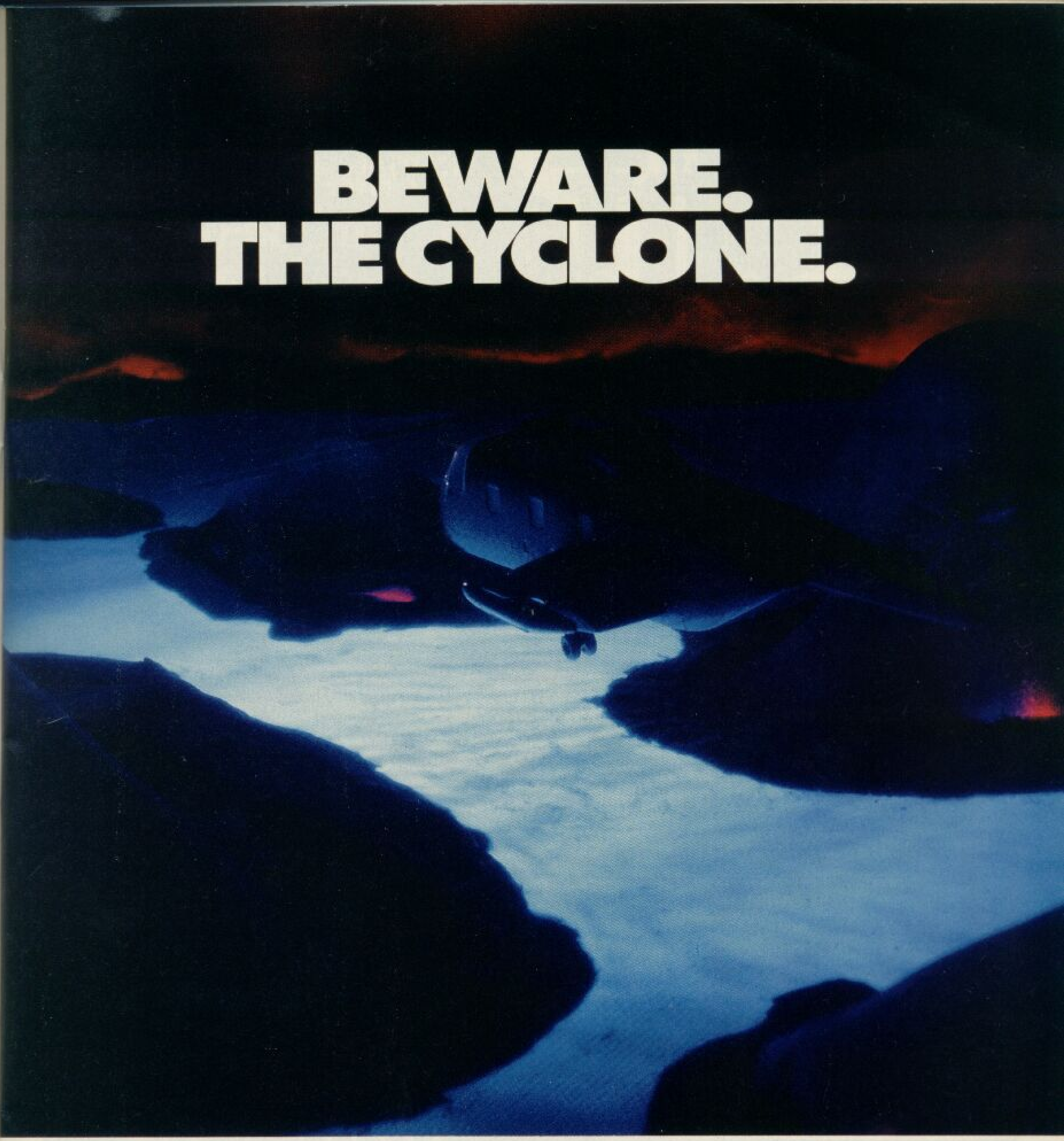
Who knows what the relationship is between telephones and computer software, but British Telecom seems to think there is one. It's launched a range of packages under the Firebird label, available for the Spectrum, CBM 64 and BBC Micro.

Priced at only £2.50, the cassette insert actually has a screen shot of what appears on your telly. By golly that's bravery for you! BT has 20 titles to kick off with, nine of which are for the Specey.

Richard Hooper said when announcing the venture, "You can now judge a game by its cover. In a market where quality and prices tend to be variable and complaints of misrepresentation frequent, Firebird software is setting new standards".

If you want to get hold of a Firebird game and check for yourself what the quality is like, then dive into your local stockist. Otherwise give BT a buzz on 01-357 3796.

BEWARE. THE CYCLONE.



You've seen the havoc Tornado Low Level can create.
Now it's the turn of Cyclone. The latest action game from Vortex.
Stunning multi-view 3D graphics. Vast dynamic
playing area. A new game designed to take the Spectrum
world by storm.
Beware. The Cyclone...is imminent.



Vortex SOFTWARE

☐ CYCLONE	SPECTRUM 48K	£6.95	
☐ T.L.L.	SPECTRUM 48K	£5.95	
☐ ANDROID TWO	SPECTRUM 48K	£5.95	
☐ ANDROID ONE	SPECTRUM 16K-48K	£4.95	TOTAL VALUE £

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YS TOP TWENTY CHART

THIS MONTH	LAST MONTH	MONTHS IN CHART	TITLE / PUBLISHER	COMMENT
1	2	7	**JET SET WILLY** SOFTWARE PROJECTS	BACK AT THE NUMBER ONE SPOT WITH A VENGEANCE! SO HOW COME IT'S TOP TURKEY AS WELL?
2	1	4	**SABRE WULF** ULTIMATE	AT LAST, IT'S BEEN KNOCKED OFF THE TOP . . . ULTIMATELY, IT HAD TO HAPPEN!
3	5	7	**MANIC MINER** SOFTWARE PROJECTS	REN'T YOU FED UP WITH HIS ONE YET — IT'S OSITIVELY ANCIENT . .
4	6	7	**ATIC ATAC** ULTIMATE	GOING UP! A NEW LEASE OF 'UN-LIFE' FOR THE SPOOK SPOOF.
5	4	6	**TRASHMAN** NEW GENERATION	THIS ONE'S ON ITS WAY DOWN . . . AGAIN! WHAT DO YOU THINK OF TRASHY'S LATEST ADVENTURE?
6	8	2	**ANT ATTACK** QUICKSILVA	NOT THIS ONE AGAIN! HASN'T ANYONE OUT THERE SEEN *ZOMBIE ZOMBIE* YET?
7	19	7	**CHEQUERED FLAG** PSION	ACCELERATING UP THE CHARTS, HERE'S ONE TO DRIVE YOU TO DISTRACTION!
8	3	6	**LUNAR JETMAN** ULTIMATE	IT SEEMS THAT NO-ONE'S INTERESTED IN THE MOON ANYMORE. WHY'S THAT?
9	12	6	**WHEELIE** MICROSPHERE	NUDGING ITS WAY INTO THE TOP TEN, THIS GAME LOOKS SET TO STAY.
10	11	4	**LORDS OF MIDNIGHT** BEYOND SOFTWARE	OK, HANDS UP WHO'S SEEN ALL 32,000 SCREENS!
11	13	4	**MUGSY** MELBOURNE HOUSE	THE RUMOUR'S NOT TRUE THAT WE'VE BEEN BRIBED TO INCLUDE THIS GAME!
12	9	7	**CHUCKIE EGG** A & F SOFTWARE	YOU'LL HAVE EGG ON YOUR FACE IF YOU LET THIS GAME SLIP AWAY UNSEEN.
13	10	2	**THE HOBBIT** MELBOURNE HOUSE	GET THE HOBBIT HABIT — THE SOFTWARE OF THE FILM OF THE BOOK, ETC.
14	16	4	**WORLD CUP** ARTIC	ALL THE FUN OF THE FOOTBALL PITCH . . . WITHOUT THE MUD!
15	14	2	**MATCHPOINT** SINCLAIR	SINCLAIR COULD BE AT FAULT SERVING UP A TENNIS GAME AFTER WIMBLEDON.
16	NEW	1	**HUNCHBACK** OCEAN	WE HAD A HUNCH THIS ONE WOULD BE BACK. WE WAS RIGHT!
17	NEW	1	**FOOTBALL MANAGER** ADDICTIVE GAMES	SO, TWO FOOTBALL GAMES IN THE CHARTS AT ONCE. WHICH DO YOU THINK'S BEST?
18	17	2	**JET PAC** ULTIMATE	NOW YOU SEE IT . . . SOON YOU WON'T? *JET PAC* LOOKS SET TO BLAST OUT OF THE CHARTS.
19	NEW	1	**TLL** VORTEX	OBLITERATE THE TARGETS IN THIS FLIGHT SIMULATION AS YOU CONTROL A SWING-WING FIGHTER.
20	NEW	1	**FRED** QUICKSILVA	WHAT'S THIS ONE DOING SKULKING AROUND THE CHART'S NETHER REGIONS? HAVE YOU NO TASTE?

JOHN HALLET

THE YS TOP 20

Here we are, it's almost Christmas and it would seem, from our chart at least, that everyone's still playing the 'oldies but goldies'. Remember, this chart is based *solely* on the votes you send in — and not on fictitious sales figures — so if you don't agree with what you see, fill in the form below (or a photocopy . . . we're not fussed) and tell us what *you* think should be topping the charts.

The carrot is still three software packages for the first voting slip to be pulled out of the Editor's hat, and this month's lucky winner is Matthew Williamson of Haverfordwest.

As you can see in *Frontlines* this month we've compiled a Christmas Turkey Chart of the top five software 'nasties'. But don't think we're going to let you off so easily! You'll notice our coupon still allows you to fill in your top three turkeys of the month — these will be used to get together our Turkey Chart for Christmas 1985. So don't forget to fill 'em in!

On a last note, when you're sending off your letters to Forum, or ordering *ZIP* or *YS MegaBasic*, why not put your voting slip in as well. It'll save you the price of a stamp! Post all entries to *YS Charts, Your Spectrum, 14 Rathbone Place, London W1P 1DE.*

YS TOP 20 READER POLL

My top five raves on the Speccy are:

1 ____
2 ____
3 ____
4 ____
5 ____

My three top turkeys for the Speccy are:

1 ____
2 ____
3 ____

Name ____
Address ____

Postcode ____

I understand that when this chart was tested — eight out of ten owners said their Spectrums preferred it. (*What? Ed.*)

**YS TOP TWENTY
YOUR SPECTRUM
14 RATHBONE PLACE
LONDON W1P 1DE**

YOUR SPECTRUM

JOHN HALLET

Why wait any longer?

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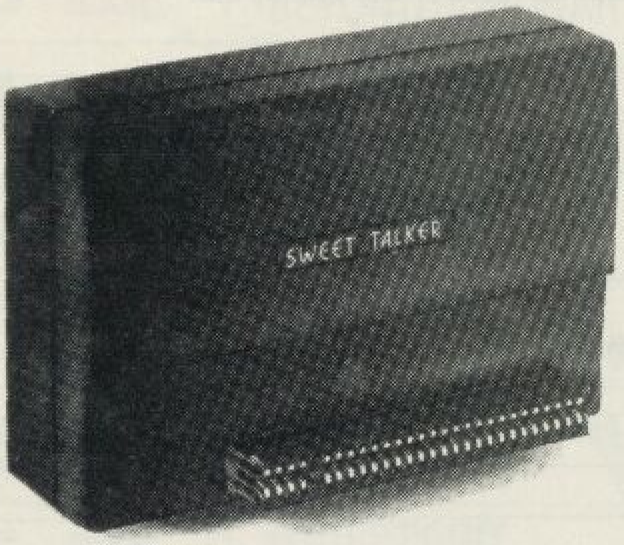


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Cheetah Marketing

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FORUM

Is there something you're not telling us? From next issue on, there'll be a crisp tenner awarded to the Star Letter of the Month. Don't miss out . . . write to Forum, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

ISSUE FORTH

I was interested to read in the September issue of *YS* an article about the '64K Spectrum' by Simon Goodwin. Two weeks prior to reading the article I had to return my 48K Spectrum to Sinclair Research for repair (for the fifth time since 1982). I have just received my 'repaired' Spectrum back and it's actually a brand new machine.

Naturally, my first action was to take the back off the machine to find out whether or not it was one of the 64K Issue 3.5 models; it is in fact an *Issue 4a* model and the circuit board is completely different to my previous Issue 2 Spectrum. I don't know how different my Issue 4a Spectrum is from an Issue 3 Mk 5 (or any other Issue 3), as I've never had the opportunity to look inside an Issue 3. Perhaps you could publish a sketch of the inside of an Issue 3 machine to enlighten me?

Andy Sheppard, Burnley, Lancs

We haven't yet managed to get our hands on one of the new Mk 5s — so it's going to be difficult to provide you with a sneak look at the said device. However, if you want a rough idea of what goes on in an Issue 3, try looking at Sexing Your Spectrum, *an article we published in the third issue of YS (where else?). If you haven't got a copy, see if you can look in a friend's as I have a rather nasty feeling it's getting rather rare. Ed.*

SHORT SHRIFT

I am writing to you because, as a devoted follower of the Sinclair cult, I went out and bought myself a copy of your highly esteemed mag. Having read this from front to back, I sent off for some back issues (1, 3 and 4) but received only 1 and 4 with a note saying that all issues of number 3 were sold out — but I would, however, receive a copy of issue 9 for my anguish. So I sat down and read the issues I now had, but soon begin to pine for my non-existent issue 3. Also to my further grief (and being a moron of the highest order) I don't understand a word (or digit??) of machine code; I therefore welcomed *Paper Data* in issue 2. But wait, yet another aid to my gradual mental demise . . . no addresses were given as to the purchase of the aforementioned books. Also, being a great lazy wally, I have an (original) copy of *The Quill* but would also like some advice on the available arcade games designers. So would you please, please, please advise me on how to:

a) Reserve myself a copy of the much sought after *YS* issue 3.
b) Order a copy of *Spectrum Machine Language For The Absolute Beginner.*
c) Obtain a copy of a good arcade games designer.

Philip Hankinson, Warrington

a) Hah!, no chance!; b) walk into Smith's.; c) see (b). Troubleshootin' Pete.

DRAG AT YS?

Hello from one of the *Your Spectrum* fans. Fine magazine, excellent reading, guaranteed to produce the bags under the eyes and the twitchy finger syndrome so distinctive of the Spectrum addict. Well done! ('And so you ought to be' says my Dad when he's trying to get me to bed.)

While I'm on the subject of my Dad, he's part of the problem I'm writing to you about. He uses a BBC-based system. Ouch, I'm sorry, I didn't really say that word. I've told him loads of times but he's just plain arrogant. His system uses a Microvitec 1451 monitor which I'd like to use with the Spectrum. I'm one of your original fans and have a complete set of *YS* (wow?), so I dug out issue 2 and read Ian Beardsmore's article on doing the necessary surgery. Everything Spectrumwise is in order (Issue 3 and outside guarantee period, etc).

My problem is whether the composite video signal produced by Ian's Spectrum mods will drive the Microvitec monitor which has RGB input. If the answer is 'no, Ian's method won't work', is there any other way to connect the two items? Some sort of interface perhaps? Do you know of any manufacturer who may produce a kit or whatever, to carry out this conversion?

Finally, a much more important question — a question which has been at the heart of many a finger-resting coffee break since the amazing Issue 1 first hooked us. Who is she, the lady on the cover? She with the green necklace and blue eyes. What is she thinking as she pensively studies the lighting system? Is this Toni Baker, Sue Denham or perhaps Penny Page? After much debate, my friends and I think we know. Fingering a scalpel with such longing . . . dreaming of hacking the then soon-to-be-released *Jet Set Willy* . . . it must be, please tell us we're right — Andrew Pennell in drag?

Mark Quilliam, Gunnislake, Cornwall

Taking your minor question first, no Ian's method won't work with the Microvitec. But if you get hold of Adapt on 01-504 2840, they'll send you an excellent RGB interface for £29.95 which does make the Speccy produce pretty pictures. As for your second and, as you say, more important question, sorry to disappoint you but Andy didn't look good enough in drag to grace our front cover. However, that's him on the front of issue 8, so don't annoy him too much or it'll be BIG trouble! Just for you, here's a photo of Andy Pennell, hacker extraordinaire . . . 'orrible, isn't it? Ed.



A HEXING QUESTION

First of all, having bought your mag since issue 1, may I take this opportunity to congratulate you on a publication which is nothing short of excellent.

However, having said that, there is one problem that I keep stumbling over in some of your articles . . . the quotation of addresses in Hex, without a decimal equivalent given!?

Now taking a purely logical standpoint to the above problem, I have come up with the following five possible solutions to this crisis situation:

1) Threaten the writers with Barry Manilow (audio or visual) if they refuse to mend the error of their ways.
2) Make me buy a Hex-Dec converter (sorry, I'm too tight-fisted to do it myself).
3) Publish a Hex-Dec converter for Hex up to at least DEC 65535 (beg, beg).
4) Threaten the writers with Barry Manilow *and* Des O'Connor (audio *and* visual!) if they refuse to co-operate.
5) Shoot myself!

Anthony Mayers, Wrexham, Clwyd

Aaargh . . . anything but Bazza and Des! Well, we'll work on option 4, but if you can't wait that long try option 5. Ed.

DUMPS ON A SHOESTRING

Looking through my back issues of *YS*, I couldn't help feeling envious at the number of conversions of Andrew Pennell's *Dumps of Distinction* program. Wouldn't it be great to have screen dumps all over my bedroom wall? All I need is a printer costing around £300! Hah!

Gazing around my room, my eyes alighted on my obsolete ZX Printer. Is it possible, I asked myself. After a few hour's work (honest!), I'd converted the program to work on my little machine. Out came the scissors and Sellotape and I'd managed the impossible (*Dramatic stuff this! Ed.*). The trimmer listing fits nicely on to an A4 sheet — glue might be better than tape to afix it, but be careful or you'll end up with nasty blotches all over the place.

The result is about the same size as Mr Pennell's dumps — but not *quite* as pretty. But if you've only got a ZX Printer and your piggy-bank's not full to bursting, what else can you do? I leave the task of pushing the ZX Printer to further limits to all the thousands of you out there who own one — come on you lot, there's nothing to be ashamed of in owning a ZX Printer you know.

David Valentine, Mansfield

On the next page is David Valentine's re-working of *Dumps of Distinction* for the ZX Printer.

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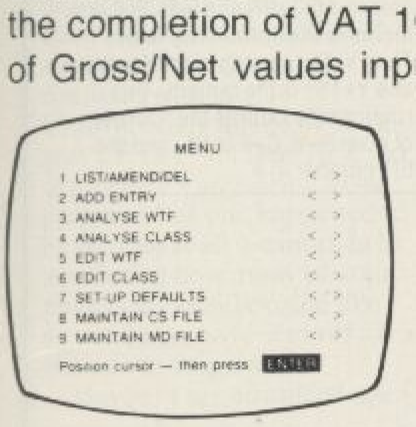
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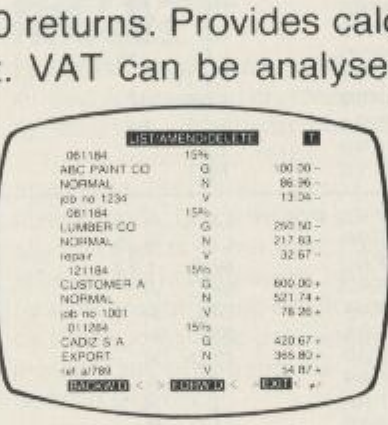
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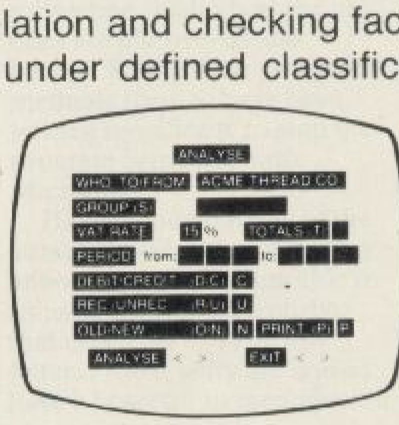
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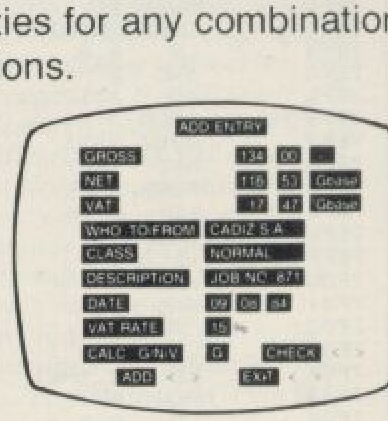
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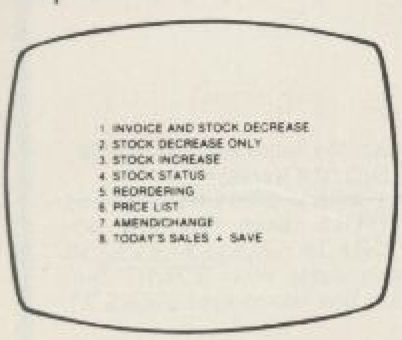








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YS12

```
7EC2              ORG   32450
5B00     PRBUF EQU   23296
```

Saves the stack pointer (SP) in case the Break key is pressed.

```
7EC2 START LD    (BOT),SP
```

Defines DE to be the next block of code printed.

```
7EC6       LD    DE,48981
7EC9       CALL  SECT
7ECC       LD    DE,27221
7ECF       CALL  SECT
7ED2       LD    DE,5398
7ED5       CALL  SECT
7ED8       RET
```

Prints out one section of the screen.

```
7ED9 SECT  LD    C,0
7EDB SECT1 CALL  LINE
7EDE       INC   C
7EDF       LD    A,C
7EE0       CP    0
7EE2       JR    NZ,SECT1
7EE4       CALL  PRINT
7EE7       RET
```

Prints out one vertical line of a section.

```
7EE8 LINE  PUSH  BC
7EE9       PUSH  DE
7EEA       XOR   A
7EEB       LD    (BUFFX),A
7EEE       LD    B,D
7EEF NXY   PUSH  DE
7EF0       PUSH  BC
7EF1       CALL  POINT
7EF4       LD    B,A
7EF5       INC   B
7EF6       LD    A,1
7EF8 NXY1  RRCA
7EF9       DJNZ  NXY1
7EFB       AND   (HL)
7EFC       PUSH  AF
7EFD       LD    A,H
7EFE       RRCA
7EFF       RRCA
7F00       RRCA
7F01       AND   3
7F03       OR    88
7F05       LD    H,A
7F06       LD    B,(HL)
7F07       POP   AF
7F08       LD    A,B
7F09       JR    NZ,INK
7F0B PAPER RRCA
7F0C       RRCA
7F0D       RRCA
7F0E INK   AND   7
7F10       LD    HL,TABLE
7F13       ADD   A
7F14       ADD   A
7F15       LD    E,A
7F16       LD    D,0
7F18       ADD   HL,DE
7F19       LD    B,3
7F1B NXY2  LD    A,(HL)
7F1C       CALL  STORE
7F1F       INC   HL
7F20       DJNZ  NXY2
7F22       LD    A,(BUFFX)
7F25       ADD   3
7F27       LD    (BUFFX),A
7F2A       POP   BC
7F2B       POP   DE
7F2C       DEC   B
7F2D       DEC   E
7F2E       JR    NZ,NXY
7F30       CALL  PRINT
7F33       POP   DE
7F34       POP   BC
7F35       CALL  CKBRK
7F38       RET
```

Stores a three-by-three character in the area of the printer buffer determined by BUFFX.

```
7F39 STORE PUSH  BC
7F3A       PUSH  HL
7F3B       LD    C,A
7F3C       LD    A,4
7F3E       SUB   B
7F3F       LD    B,A
7F40       LD    HL,PRBUF-32
7F43       LD    DE,32
7F46 STOR1 ADD   HL,DE
7F47       DJNZ  STOR1
7F49       LD    A,(BUFFX)
7F4C       LD    B,3
7F4E STOR2 RL    C
7F50       CALL  C,PLOT
7F53       INC   A
7F54       DJNZ  STOR2
7F56       POP   HL
7F57       POP   BC
7F58       RET
```

Sets the area containing the three-by-three character in BUFFX.

```
7F59 PLOT  PUSH  AF
7F5A       PUSH  BC
7F5B       PUSH  HL
7F5C       LD    C,A
7F5D       AND   248
7F5F       SRL   A
7F61       SRL   A
7F63       SRL   A
7F65       LD    E,A
7F66       LD    D,0
7F68       ADD   HL,DE
7F69       LD    A,C
7F6A       AND   7
7F6C       LD    B,A
7F6D       INC   B
7F6E       LD    A,1
7F70 PLOT1 RRCA
7F71       DJNZ  PLOT1
7F73       OR    (HL)
7F74       LD    (HL),A
7F75       POP   HL
7F76       POP   BC
7F77       POP   AF
7F78       RET
```

Prints out the first three lines of the printer buffer, and then clears them.

```
7F79 PRINT DI
7F7A       PUSH  BC
7F7B       PUSH  HL
7F7C       LD    HL,PRBUF
7F7F       LD    B,3
7F81 PRIN1 PUSH  BC
7F82       CALL  3828
7F85       POP   BC
7F86       DJNZ  PRIN1
7F88       LD    A,4
7F8A       OUT   (251),A
7F8C       LD    HL,PRBUF
7F8F       LD    DE,PRBUF+1
7F92       LD    BC,96
7F95       LD    (HL),0
7F97       LDIR
7F99       POP   HL
7F9A       POP   BC
7F9B       EI
7F9C       RET
```

This is a full screen point, that is it includes the bottom two lines. Thus Y=0 is the top of the screen and Y=191 is the bottom. This routine also returns the address of pixel B=Y, C=X in HL, and the BIT number in A.

```
7F9D POINT LD    H,64
7F9F       LD    A,B
7FA0       AND   192
7FA2       SRL   A
7FA4       SRL   A
7FA6       SRL   A
7FA8       ADD   H
7FA9       LD    H,A
7FAA       LD    A,B
7FAB       AND   56
7FAD       SLA   A
7FAF       SLA   A
7FB1       LD    L,A
7FB2       LD    A,B
7FB3       AND   7
7FB5       ADD   H
7FB6       LD    H,A
7FB7       LD    A,C
7FB8       AND   248
7FBA       SRL   A
7FBC       SRL   A
7FBE       SRL   A
7FC0       ADD   L
7FC1       LD    L,A
7FC2       LD    A,C
7FC3       AND   7
7FC5       RET
```

Scans the Space key and returns to Basic if it's pressed.

```
7FC6 CKBRK PUSH  AF
7FC7       PUSH  BC
7FC8       LD    BC,32766
7FCB       IN    A,(C)
7FCD       RRCA
7FCE       JR    NC,BRK
7FD0       POP   BC
7FD1       POP   AF
7FD2       RET
```

Puts SP back to its old value, thus effectively clearing the stack.

```
7FD3 BRK   LD    SP,(BOT)
7FD7       RET

7FD8 BUFFX DEFB  0
7FD9 BOT   DEFW  0

7FDB TABLE DEFB  224,224,
                 244,0
7FDF       DEFB  192,96,
                 192,0
7FE3       DEFB  160,64,
                 160,0
7FE7       DEFB  32,64,
                 128,0
7FEB       DEFB  96,0,
                 96,0
7FEF       DEFB  64,0,
                 64,0
7FF3       DEFB  0,64,0,0
7FF7       DEFB  0,0,0,0
```

A disassembled listing of David Valentine's re-working of Andrew Pennell's *Dumps of Distinction* on to the ZX Printer. You see, pigs can be made to fly!

ZIPPING ON A PENSION

At last, somewhat belatedly, I've got Simon Goodwin's *Zip Compiler* to work — four months after typing in the Zip Library. So why, you may ask did it take me so long? Partly it was my dim eyesight and dimmer wits (well, I am in my early 70s) but some of the blame must go to Simon himself.

To explain: after sorting out my many mis-typings, I found it got jammed on line 90 of the example program in the July issue in a never-ending loop and it was only after trying every bug-tracing stunt I could think of that I eventually found the cause. Unlike nearly all the other variables, he introduced variable 'L' in capitals,no doubt aware that his daisywheel printer produced straight 'l's which could be confused with '1's. Unfortunately in line 6755 he puts'LET t1=INT(u+l)/2': so of all the '1's appearing in his program, this one happened to be not one at all. I cannot help wondering how many of your readers got bomboozled like me, and may have sent off for a cassette in desperation.

Maybe at my advanced age I should not be concerning myself with computers. On the other hand, I want to keep my fast diminishing brain cells active as long as possible — but not by hacking into *Jet Set Willy*.

Looking forward to the next issue of *Your Spectrum*.

H E Hammond, Luton, Bedfordshire

How else could we get you all to buy the tape? But seriously, Mr Hammond, thank you very much for sorting out the bug. We've had the odd problem with ZIP, *but overall I hope that all who've mastered the program will agree that it's probably the best compiler on the market. Ed.*

AVAST YE SOFTWARE HOUSES

I am anxious to comment on a subject foremost in my mind at the moment — software piracy.

In the *older days* of the Spectrum, everybody copied their friends' tapes with two tape recorders — but now, this is being made impossible by a new technique being employed by the tape-to-tape protection system (any of you pirates noticed it yet?).

This new system is making home copying and commercial piracy a thing of the past (I always imagine commercial pirates having huge Hi-Fi systems recording tape-to-tape at double speed). Since a lot of pirates probably find the tape copiers available slow and boring, this should bring down piracy to a tolerable level.

OK, all well and good, the companies have found a great way to beat most pirates — but still companies are obsessed with putting more and more protection into the software. I've spent an incredible amount on software, over £30 on Microdrive transfer tapes alone and, having beaten the major software pirates, I see no reason why the software houses should make it difficult for us Microdrivers. They consistently add new protection methods as the old ones are discovered and beaten. Some of the protection methods seem to have been written specifically to stop the program being put onto Microdrive!

Having bought many of the latest software titles, it was my annoyance at not being able to transfer them to Microdrive that urged me to write this letter. Please, software houses, have a heart for us menials with Microdrives.

Richard Harrison, Forest Hill, London

When you start getting onto the subject of piracy, you're treading on very shaky ground. Although Your Spectrum *in no way condones the pirates, there is a very thin line between actual piracy and putting software you have bought onto a different media for ease of use. If a software house made a program simple enough for anyone with a basic knowledge of computing to put it on to Microdrive cartridge — then a true pirate would see it as a gift. If the software houses actually included a 'Microdrive SAVE' option in the program, this might go some way to solving the problem. Unfortunately, we don't live in a perfect world, and software houses have nothing to gain except minimal increased sales through making their software Microdrive compatible. Even Sinclair Research doesn't include a 'Microdrive SAVE' option in its programs, so unless there's a pretty drastic change in the attitude of software houses towards Microdrives, I don't think we'll be able to do anything except resort to the ever-improving transfer tapes . . . Troubleshootin' Pete.* YS

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Even **Ian Beardsmore** *can be bitten by the games bug — and memory's no problem when you use his base 255 numbering system!*

YOUR NUMBER'S UP

I've been described as 'hard-bitten' and 'jaded' in my time (*And a whole lot else I shouldn't wonder. Ed.*) . . . and you want to know why? Simply because games of any kind — yes, even *Jet Set Willy* — leave me cold. So, you can imagine the psycho-physical trauma my self-image underwent when a matter of months ago I got hooked on a wargame by CCS called *Pacific War*. Never heard of it? Don't worry, no-one else has either!

Anyway, the upshot of all this is that I decided to write my *own* version of this great game.

DEALING WITH THE DATA

I'd already worked out how I was going to store the data — using a database as the crux of the program — but it was only when I was explaining to a friend that I would need to use three bytes of storage to store the necessary data that I began to see his eyes glaze over. He was perplexed . . . and so was I. It seems that what was obvious to me, namely using the character set as a base 255 numbering system, had not occurred to him — or to anyone else I mentioned it to. How do you think that mega-sized dungeons are produced then?

Most of the techniques I'll explain here are quite simple, but the contraction of storage space is phenomenal. First, think of how numbers are built up in decimal and Hex (using base 10 and base 16 respectively). In decimal, when you reach '9', you add another digit — in Hex, having '0' to 'F', you don't need another digit until you reach 'F'. Well, using the character set, you wouldn't need to add more digits until you reached '255', and even then each character only takes up one byte.

Maybe I ought to explain that a little. Each of the Spectrum's keywords, punctuation, etc, are stored as single-byte tokens. So commands like SAVE, LOAD, etc, take up the same storage space as punctuation, such as ',', '!', etc. Thus, if you could store direct commands as strings and then add them together, you could store numbers up to 16,777,215 in three bytes.

Take a look at the first two programs I've included so that you can recap your knowledge of string handling. The first program allows you to input anything from the Spectrum keyboard and output it as a string. The second program takes two strings and converts them into numerical data, adds them together and outputs them as a string.

```
 10 LET z$=CHR$ 65: LET y$=CHR$ 200
 20 PRINT z$,y$
 30 REM
 40 LET z$=CHR$ 65 AND 66
 50 PRINT z$
 60 REM
 70 LET z$=" THEN "
 80 PRINT z$,: PRINT LEN z$
 90 LET z$="* THEN *"
100 PRINT z$,: PRINT LEN z$
110 REM
120 LET z$=CHR$ 148: LET y$=CHR$ 69: LET x$=CHR$
137: LET w$=CHR$ 10
130 PRINT z$;"  ";y$,x$;"  ";w$
140 REM
150 LET z$=CHR$ 20
160 PRINT z$
```

This program allows you to input anything from the Spectrum keyboard and output it as a string.

```
 10 LET z$="!@£$567:£"
 20 LET y$=" THEN NOT  GO TO qweASD"
 30 LET a=CODE z$(5)
 40 LET b=CODE y$(2)
 50 PRINT a,CHR$ a,b,CHR$ b
 60 LET c=a+b
 65 PRINT "----- +                 ----- +"
 70 PRINT c,CHR$ c
 80 LET x$=CHR$ c
 90 PRINT : PRINT x$,CODE x$;"  ";LEN x$
100
110 LET d=CODE z$(1 TO 4)
120 PRINT d,CODE z$(1)
```

This routine takes two character strings, converts them to numeric data, adds them together and outputs the result as a character string.

```
  4 DIM A$(4,100)
  5 DIM Z$(3)
 10 LET a=0
 12 LET b=0
 14 LET c=0
 20 INPUT a
 25 PRINT a
 30 IF a>255 THEN  LET b=INT (a/256)
 40 IF b>255 THEN  LET c=INT (b/256)
 50 LET Z$(1)=CHR$ c
 55 PRINT CHR$ c,c
 60 LET b=INT (b-(c*256))
 70 LET Z$(2)=CHR$ b
 75 PRINT CHR$ b,b
 80 LET a=INT (a-(b*256+c*65536))
 85 LET Z$(3)=CHR$ a
 90 PRINT CHR$ a,a
 95 PRINT
100 LET a$(2,60 TO 62)=Z$
110 PRINT a$(2,60 TO 62)
120 STOP
```

```
175000
?                          2
ATTR                       171
i                          152

?ATTR i
```

A decimal to base 255 convertor; simply input the number you want converted and it prints out the relevant Spectrum characters you need in your character string. An easy way to store any number up to 16,777,215 in just three bytes!

BACK TO BASE

OK, now take a look at the third program I've included. This is a decimal to base 255 converter — all you do is input the number you want converted and it prints out the Speccy commands, etc, you'll need to use in your string — and it'll all be stored in just three bytes. Clever, eh?

The program works by finding the larger numbers first. So, variable a and Z$(3) will hold the units of the number, b and Z$(2) will hold the '255's, and c and Z$(1) will hold the '65536's. The example program was written for my own specific purposes. I had four aircraft carriers, each with 100 bytes of data. As I wanted to allocate 175,000 gallons of fuel to the second carrier, the data is stored in three bytes in the field 60 TO 62 — thus, A$ represents the carriers and Z$ the temporary store for the data. In the example printout, you can see that the commands I need to put in a string are '?', ATTR and 'I'.

Number bases are a fairly complex idea, and I am *not* a mathematician, but the example here does work and can be amended to suit your own particular requirements.

BUT I DIGRESS . . .

Partly as a digression and also to get your grey matter on the boil, try changing line 95 to read 'STOP' in the decimal to base convertor, and enter the number 17000. No problem — apart from the fact that there's nothing on the screen. Ah, but being a clever *YS* reader you've probably guessed that CODE 16 is unprintable — try changing the program back the way it was and you'll get your error message.

What I've stumbled on to here is 'protection' — where the PAPER and INK colours are the same . . . so nothing much shows up on-screen. Put line 95 back to 'STOP' and enter the number 1052688. The CHR$ would appear to be just visible . . . the only problem is that we're seeing the CODE. Now try entering the numbers 1052689 and 1052690; the last number should really put the cat amongst the pigeons!

Next month, I'm going to be dealing with a number of small problems that some *YS* readers seem to be labouring with. But, in the meantime, if there's anything bugging you (literally!) then write to me, Ian Beardsmore, c/o *Your Spectrum*, 14 Rathbone Place, London W1P 1DE. YS

INTERFACE ROM

THE INSIDE STORY

Andrew Pennell *discusses the changes made to the Interface 1 ROM.*

Following my comments in a previous article, there have been numerous enquiries about the forthcoming Interface 1 ROM — the one Sinclair Research is apparently still denying even exists! Well here's how you 'spot the difference.'

It's an open secret that the existing Interface 1 has various bugs — a fact that was realised in Cambridge quite soon after the Microdrive launch. Thus, a new ROM was born, the code being finalised in early February this year. However, actual production was delayed by the QL difficulties and has only recently begun. Even now, at the time of writing, the release date has still to be announced. To check which ROM you have, enter the following line after a NEW or switch-on:

```
CLOSE #0:PRINT PEEK 23729
```

This will either give '0' for an old ROM, or '80' for the new one. The differences are fairly apparent from Basic. To begin with the main Microdrive commands have been speeded up considerably, so CAT and OPEN "M" now take seven seconds, instead of the previous 10. The improvement has been made by a clever piece of code which calculates the length of the tape — instead of just assuming it's always 255 sectors as the old ROM does. The other speed difference occurs during a FORMAT. On the old ROM it takes about 35 seconds; on the new it's around 10 seconds faster. The only drawback is that there's a slight loss in capacity with the new format routine.

SPACING OUT

The other difference available from Basic is in the RS232 software. 'T' type streams now support the TAB function properly, and the double-space bug has been corrected. Unfortunately, the former function requires two bytes for system variables, in fact using the previously 'unused' ones at 23728 and 23729. The first holds the cursor position, and the second the printer's width — hence the default value of 80 after initialisation.

Along with these improvements, many of the bugs in the ROM have now been corrected — the most notorious being the 'low RAMTOP' one that crashed the machine if the stack was too close to the channels area. The CLOSE# bug has also been fixed, in exactly the same way as I suggested in my book! Also fixed is a very rare bug in the network software that caused it to fall over; now it preserves the value of IX during a subroutine call.

However, some bugs still remain, in particular the 'big Basic' one; try loading a large Basic program from Microdrive which is too big to fit and the machine still falls over with both types of ROM. Also in the new ROM is the 100 bytes of code that prints out memory in Hex, used for debugging when the original ROM was first written. It's strange to see it still there as the new ROM is already pushed for space (there are only 31 unused bytes left, compared with over 1K in the old version). One addition though, is a copyright message, together with the author's initials — MJB.

BASIC IMPROVEMENTS

The improvements for the Basic programmer are very nice and all existing Basic Microdrive software should work on both ROMs, but for the machine code programmer there's a real incompatibility problem. When the numerous improvements were made to the code, it was clearly decided not to use patches that would retain compatibility; they just re-wrote it regardless. Some programs will work OK, just so long as they use the existing hook codes only. If they call other routines directly, the chances are they won't work. Practically everything has moved, apart from the syntax routines, up to 0800 Hex. Although an extra eight bytes have been added at 0234 Hex, they've been compensated for by truncating an unused error message shortly after it.

The hook codes themselves are similar — the working ones do just the same as before (albeit, some more quickly), while the non-working ones have been corrected. Code 2B now does what it should originally have done, namely 'Create an M area'; and code 2F (for the network) also now works. In addition, two extra codes have been added, one to read the next sector header, the other to open a 'B' channel. Neither seem particularly useful.

CHECK IT OUT

For the full rundown on the differences between ROMs, anxious readers will have to await the reprint of *Master your ZX Microdrive,* which should just about be available by the time you read this.

The new ROM is certainly a great improvement on the old but it's doubtful whether any upgrade service will be offered. The ROMs are not socketed in the Interface 1, making an upgrade not only difficult, but unlikely.

STOP PRESS

I have just obtained the third version of the Interface 1 ROM, and it's very similar to version 2. The reason for its release is improved compatibility with the QL over the network and this has been achieved by a slight timing modification to the 'buffer' routine. The mod uses no extra bytes. The only other difference is that an extra instruction has been added, moving all subroutines from 1C3C Hex on in memory by two bytes. I'm not 100 per cent sure what the extra instruction does, but I think it's meant to improve capacity during a FORMAT. YS



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BREAKING AND ENTERING

The letters columns of various computer mags are occasionally scorched by very upset arcade players complaining that the POKEing of *JSW* or similar destroys all credibility in the top scores they have virtuously and arduously attained. What these purists do not wish to acknowledge is that cheating is a skill no less difficult to master than their own cherished ability to press a button at precisely the right moment. It must be admitted that the rewards for deviousness are somewhat greater than those for virtue, but that's merely the way the world works. Confucius he say "You have to turn the handle the way it goes, not the way it ought to go".

Let me state, right from the very beginning, this magazine does *not* condone pirate copying. It's both illegal and immoral, and it discourages the development of quality software. However, there's no legal or moral objection to breaking the protection on a program in order to examine the programming methods, make alterations, or even just for the hell of it! Under the copyright laws (as you may read in the notice taped to the photocopier in any library) it's perfectly legal to make a copy of a work for the purposes of private study; the only stipulation is you must not use such a copy for other purposes, or pass it on to others. Private study is what we are proposing here.

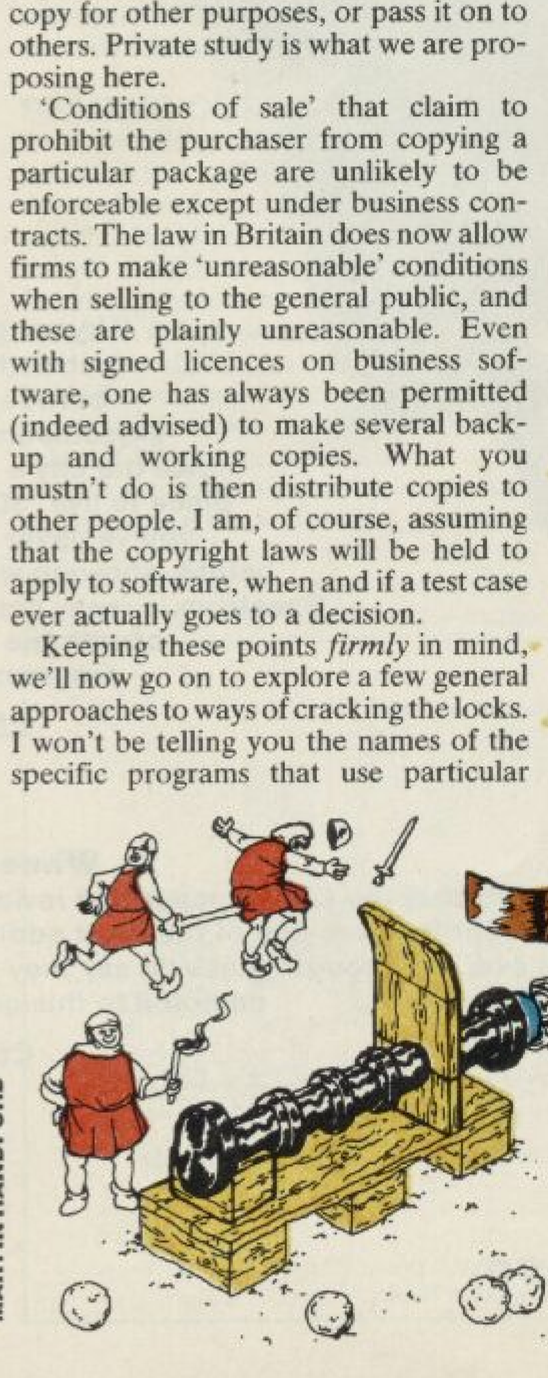
'Conditions of sale' that claim to prohibit the purchaser from copying a particular package are unlikely to be enforceable except under business contracts. The law in Britain does now allow firms to make 'unreasonable' conditions when selling to the general public, and these are plainly unreasonable. Even with signed licences on business software, one has always been permitted (indeed advised) to make several backup and working copies. What you mustn't do is then distribute copies to other people. I am, of course, assuming that the copyright laws will be held to apply to software, when and if a test case ever actually goes to a decision.

Keeping these points *firmly* in mind, we'll now go on to explore a few general approaches to ways of cracking the locks. I won't be telling you the names of the specific programs that use particular methods of protection ... there's no point in making it *too* easy!

SPECTRUM BREAK DANCE?

It's just another piece of social misdirection, that old saying about "cheaters never prospering". Probably it was put about by a lot of prosperous old cheats who were anxious to minimise competition. In fact, the practise is not at all deleterious to one's well-being, provided one indulges the vice in private and publicly inveighs against such depravity in horrified tones.





MARTIN HANDFORD

CHEATING BY NUMBERS

But how do you get started? Spectrum programs are often protected by ingenious methods designed to help stop piracy (rather than cheating) to the extent that one even begins to suspect that 'protection' is the favourite game of the programmer! These measures are of little use in preventing piracy, in any case.

At a recent press launch, Melbourne House (of *Penetrator, The Hobbit, Mugsy, et al*) admitted that its cassette protection routines apparently had no effect on the level of piracy and sales on games so protected — as compared to games published without protection.

The latest vogue is for fast loading routines which, while purporting to save loading time, usually appear designed to make tape-to-tape copying less reliable. Inevitably, they also make legitimate loading of the tape you paid for trickier, with the faster speed offset by the need to try several LOADs before one actually works! This can only be counter-productive from the publisher's point of view.

DEEPER AND DEEPER

The first point to make is that you'll not get far with most programs unless you learn at least a little machine code. Luckily, cracking protection is both an ideal way to learn and an excellent motivation. You may not get into every tape you try to chisel open, but when you strike gold, it'll make up for any amount of failure.

There are a number of books around which will help you to learn machine code, but when it comes to breaking Spectrum protection there are just two which I consider indispensable. These are *Understanding Your Spectrum* and *The Complete Spectrum ROM Disassembly* from Melbourne House. The first, by Dr Ian Logan, will get you started on machine code and at the same time give you a lot of information on how the Spectrum ROM routines can be used by your own programs. The second book, though not for the beginner, is invaluable once you know enough about machine code to be able to follow it.



GOING EQUIPPED

Besides knowledge (just a little to start with) you'll need a few handy tools — the software equivalent of prybar, celluloid ruler ... and nitro!

Nothing is so helpful as a nice compact little Hex handling utility, writtin in Basic so that you can add things as you need them and carve them out again when space gets tight. The one I use came from the book mentioned above. It's tiny and simple and worth more to me for this kind of work than the full feature disassembler on my disk-based computer. This is little more than the sort of Hex loader that gets published with machine code games so you can type them in, but the utility allows you to list code as well as enter it. Mine gives me both decimal and Hex simultaneously, and calculates the two-byte addresses in decimal as well. A quick scrabble through back issues of *YS* should reveal something suitable for conversion.

The next essential is a 'header reader' that'll tell you what length of screech is Basic or bytes, what the start LINE is (if any), where the CODE LOADs are going to go and how long they are. There was a nice header reader in issue four — shame on you if you missed it! Send for a back number (and a subscription too, to make sure it doesn't happen again).

Of course, some LOADs have no header — but that just puts the smile on the coconut.

IN THE BEGINNING

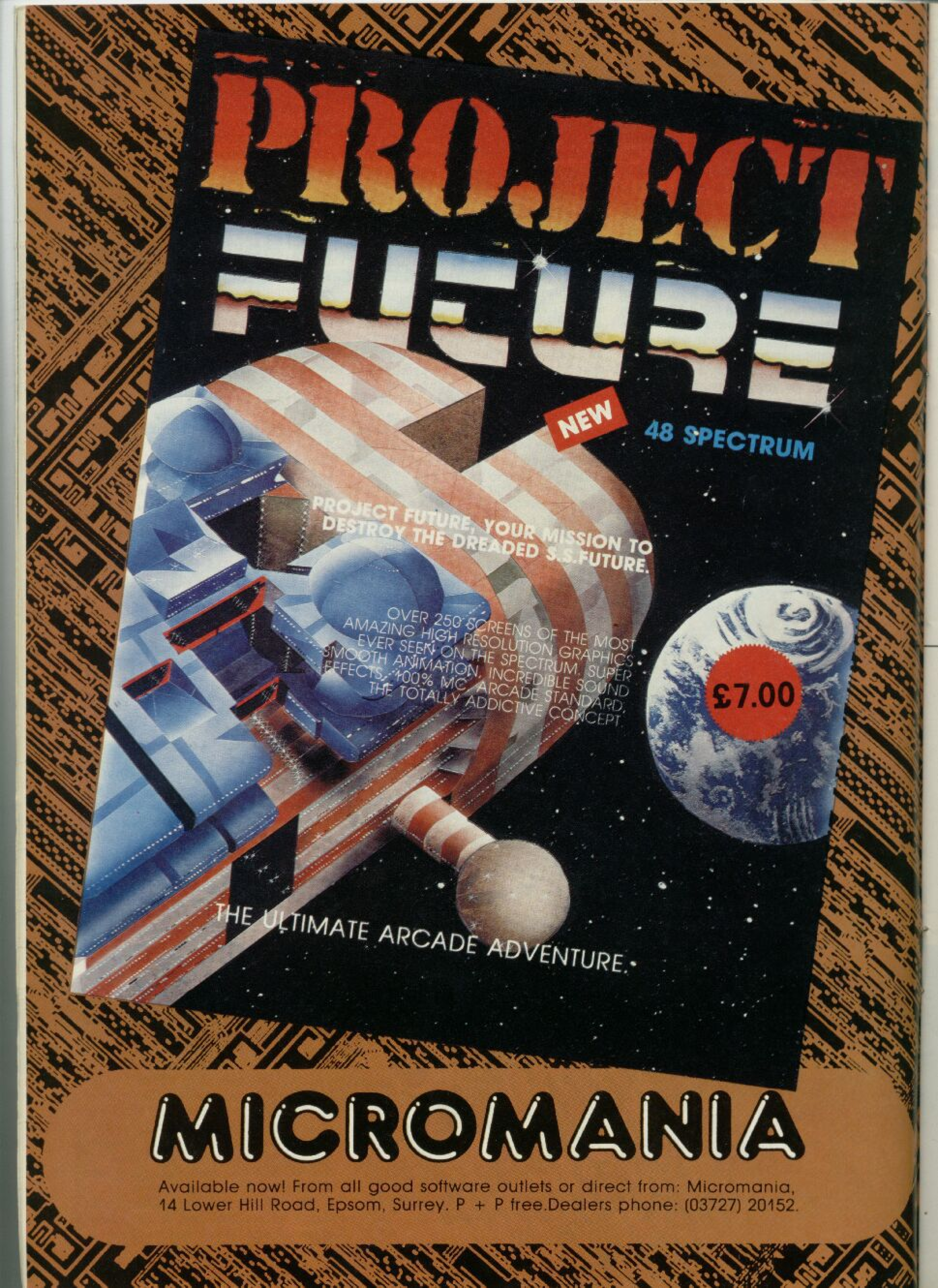
As with any new endeavour, start with something easy and work up. Protection was a lot easier to get through a year ago, so try your hand at an older program before tackling a fast loader.

Once a program is running it's too late to do any clever hacking tricks. Occasionally the writer will leave in a 'magic word' for his own convenience (like 'WRITETYPER' in *Jet Set Willy*) but even if this is the case, you'll only unearth it by breaking into the program. You won't find it by guessing, not in a million (no exaggeration!) years.

'Once it is running' includes the short loading program preceding most games. These usually disable or 'bomb' the Break key to stop you from interrupting a LOAD to get a look at part of the program.

The classic method of sussing out the lock on a program is to use MERGE instead of LOAD to get the Basic loader program aboard. Once in the Spectrum, without having been auto-run, the loader can be investigated for clues about the main program (which is usually a block of machine code). The loader will often tell you the USR address of the start of the M/C proogram, and in the case of headerless LOADs, there will be a bit of code somewhere (possibly POKEd into a REM statement) to load the machine registers with the address and length of the LOAD and call the appropriate ROM routine.

Naturally, the protection artist (PA for short) knows that this is the classic approach and takes measures against it.


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There are three general methods of foiling an investigation by MERGE.

One of the most popular ways is to have a loader of just one line, that is something like '10 LOAD "" CODE'. This gives you no information beyond the fact that all the protection is in the CODE LOAD to follow. This is often used with a block of code which includes a Basic program and the system variables as well as the M/C game itself. That Basic program might start like this:

```
10 SAVE  "TEEHEE" CODE 23552,40000
20 POKE  23659,0:REM bomb the break key,
         then continue with the rest of the
         program
```

The programmer SAVEs this program with GO TO 10, and when this block of code is loaded, the Spectrum thinks it has just finished doing line 10 (because that's what the system variables just loaded tell it) and it starts working on line 20. This method gives you a CODE LOAD which has an auto-run, and is less easy to crack than a Basic LOAD with auto-run. It also makes a game written in Basic load as if it were machine code. The code may start at 16384 to LOAD a title page in the same block.

Of course, the loader could be packed with false information. Because of the way the Spectrum Basic stores numbers, the visible part of the listing can be POKEd with spurious and misleading figures without affecting the invisible five-byte floating point notation which follows each visible number in the listing. The Spectrum only uses the invisible part itself, so protection artists can put whatever they think will be most misleading into the visible part. The careful hacker will not take the figures on trust, but PEEK out all the invisible notations, just to make sure.

Last, but not least, MERGE won't work! The copyright message rides again! The PA has POKEd a line number to be bigger than about 32,512. 'POKE (address of first byte of line number), 128' will do the trick for him. this confuses the MERGE routine in ROM, which doesn't know how to deal with illegal line numbers. You just need to POKE the same address with zero — once you've got in, that is. You can't use MERGE, so you get in by using LOAD, but with the header from another program — one that doesn't auto-run and is as long or preferably longer than the loader program. LOAD the 'tame' header, then switch tapes and play the protected program (just the part after the header) as if it were the rest of the 'tame' program. 'Et Viola!', as the starving cellist said.

Using a 'tame' header is useful in other situations too, such as with headerless LOADs. Once you've LOADed it, you won't be able to see the line with the impossible line number. This won't matter if the PA has put in a line at the end of the program, just to have the impossible line number and stop MERGE from working. If the PA's POKEd the number of a line that actually has some program in it, then it'll have to be un-POKEd before the line will run.

There is, of course, nothing to stop the keen and/or dedicated protection artist from using all three of the above, or even from disguising one approach as another. Dodges such as setting the INK to the same colour as the PAPER (which won't fool a printer) may be added for nuisance value. POKEing in impossible INVERSE numbers will make a listing unLLISTable as well as unLISTable. POKE them out again. It's better not to use EDIT, because editing a line with falsified numbers will cause the invisible notation to be changed to agree with the visible figures — which is not what you're after! Nothing the PA can arrange is proof against what you can do, but they'll try to wear you out before you unravel the last knot.

AFORE YOU GO ...

Next month, I'll be looking into 'headerless' loaders with a number of hints and tips on what to do with them. There'll also be some other interesting titbits for you to play around with ... so be there!

On a *very* important note, it must be stressed that in no way am I or this magazine condoning software piracy — it's illegal! If you're looking for a quick way to provide free copies of software for a few of your mates then you've just read the wrong article ... but if you want to find out more about that little black box of tricks, then I applaud you and look forward to your company next issue. YS

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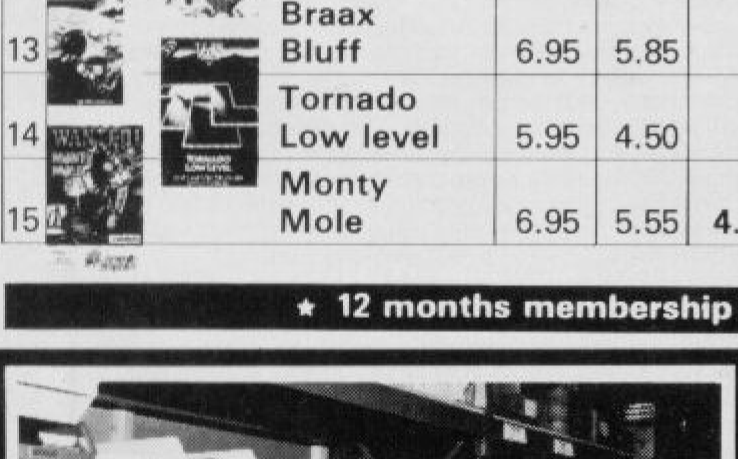
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SPECTRUM+

As predicted in our last issue, Sinclair Research did indeed launch an upgrade to the ZX Spectrum — the ZX Spectrum+. Max Phillips grabbed it as it came through the door to give us his verdict.

Well, the great day came . . . and went. There was no major launch for the Spectrum+, just an anonymous knock on the editor's office and a cheery, "Look what you've got in the post this morning!" This isn't the type of fanfare we've come to expect from Sinclair Research . . . but then neither is the new machine.

The Spectrum+ (or the 'Plus' as I'm sure it'll be known on the streets) is the much-awaited upgrade to the ZX Spectrum. But don't throw your old Speccy out of the window just yet, the new one's just a quick cosmetic job. All you're getting is a new case and keyboard, six bundled programs, a shiny new user guide and a slick intro tape. Oh, I almost forgot . . .and a price rise to £179.95!

WITH LOOKS TO KILL

Looking like a sawn-off QL with a very crowded QL-style keyboard, the Spectrum+ is certainly better built than its predecessor and includes two fold-down feet in its base; these tip the machine to a suitable typing angle for users who can't afford an Interface 1. The new casing allows a free flow of air through the *real* 'QL-type' grills and should help with the overheating that dogged some Spectrums in the past.

The only *genuine* mod that I could find on the whole machine was a reset button tucked under the left edge of the case. Pressing it is the same as switching off and on, so its only use is to save wear and tear on the plugs — there's still no warm-restart facility.

Moving inside the case, there's nothing but an ordinary Spectrum; it looks like an Issue 3, but carries a very original '1983 issue 4B' label. The ROM is identical to the Spectrum (you can check this with the VERIFY command) so, unless there are further board mods that I couldn't unearth, absolutely *all* Spectrum software and hardware should work with the Plus. And, I'm afraid to report, this may turn out to be the machine's best feature.

(Chatting around the subject a little, if I may, it'll be interesting to see if a program can be made to tell which of the two machines it's running on. There's no simple message in ROM to make the job easy — but it would allow programs to adapt between the two different keyboards so that the user was never asked to press keys that didn't exist and so on.)

ON-BOARD ADD-ONS

The Spectrum+'s keyboard has extra keys to simplify the keyword and editing system; these are hard-wired to produce the same signals as the original keyboard — doing it this way meant that there was no need to alter the firmware. A positive side-effect of this is that, although many keytops are unmarked, all the original key sequences on its predecessor still work. A hardened Spectrum user will still probably find it easier to use Symbol Shift and the 'P' key for quotes than go looking for the separate quotes key . . . but for new users — well, that's another story.

There are now two Caps Shift and two Symbol Shift keys. What's more, you can go straight into Extended or Graphics mode at the press of a *single* key. Edit, Delete and Break also get their own keys, as do True Video and Inverse Video (although the latter two do seem rather unimportant). Purists, like the rest of us, would argue that Delete should really be above the Enter key and Break should be out of the way on the left . . . but that's the way the keyboard crumbles. What did you expect Sinclair Research to do anyway — follow established trends?!?

The most obvious benefits are separate cursor keys, quotes, semi-colon, full stop and comma keys, and a relatively full-sized Space bar; with a bit of practise, you can even type on it! Even so, I'm not convinced the new keyboard is that much of an improvement — if you remember the comments generated about the QL's keyboard, it's hard to imagine why Sinclair Research has plumped for the same design . . . apart from the fact that it looks very stylish alongside its big brother, the QL.

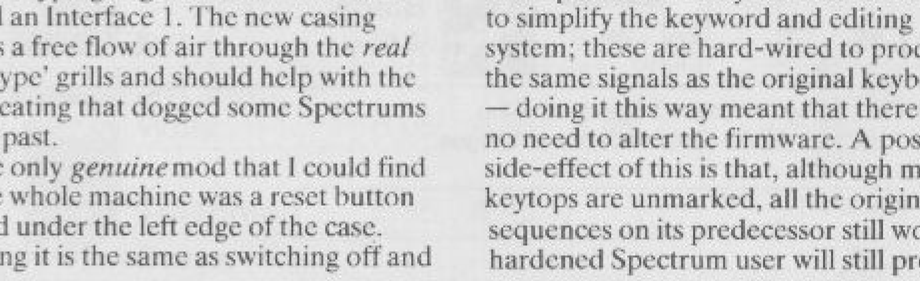
Despite the new keys, the layout remains awkward and the absence of colour coded legends is surprisingly a real pest — to be honest, I'd kind of got used to that colour scheme. I'd like to say that the keyboard of the Plus is more reliable than its predecessor, but even so the review sample had started to come to bits; for example, unless pressed *very* gently, the 'J' key would generate a 'j' (or 'LOAD') on the way down and a 'g' on the way up. Another thing that bothers me . . . just how long will the keytop legends stand up to constant wear and tear?

ADDITIONAL PLUSSES

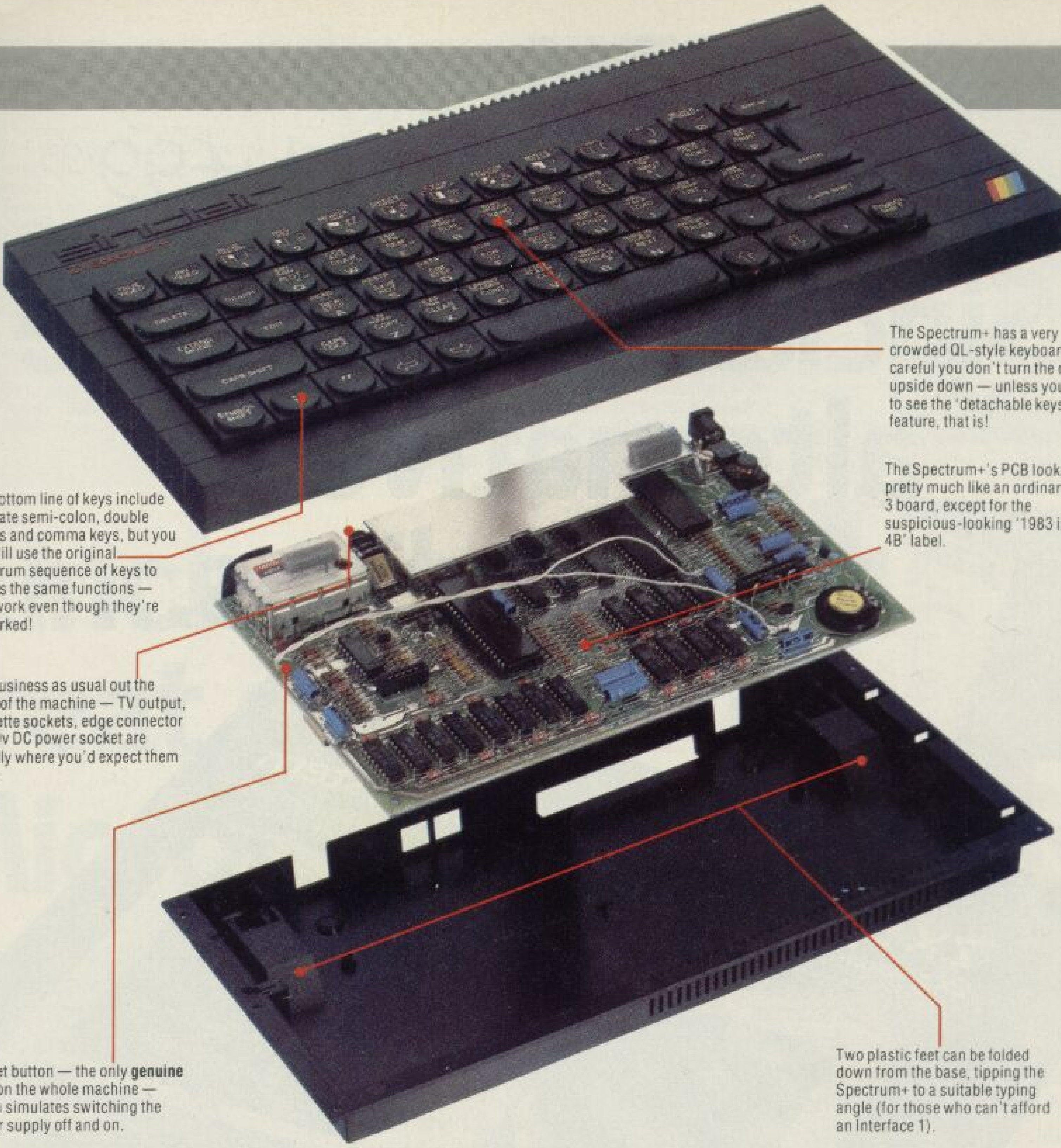
The Spectrum+ *User Guide* is really twee. Published by Dorling Kindersley, it's a full colour, heavily designed book that looks more like a 'week-by-week, builds into a pile of magazines you never read' series than a manual. The message is loud and clear. From now on, computers must be as presentable and approachable as videos and washing machines.

Although the new book is a triumph of its genre and will no doubt be welcomed by newcomers to computing, it *has* to be less detailed than the original Spectrum manual . . . it's smaller for a start! For a computer manufacturer whose success is based on the expertise of its customers, this is a mistake. By all means have such a simple introductory book . . . but don't leave out the old manual as well.

NEVER 'EARD OF IT!



Sir Clive Sinclair still denying the existence of a new machine four days before the launch of the Spectrum+.



The Spectrum+ has a very crowded QL-style keyboard. Be careful you don't turn the device upside down — unless you want to see the 'detachable keys' feature, that is!

The Spectrum+'s PCB looks pretty much like an ordinary Issue 3 board, except for the suspicious-looking '1983 issue 4B' label.

The bottom line of keys include separate semi-colon, double quotes and comma keys, but you can still use the original Spectrum sequence of keys to access the same functions — they work even though they're unmarked!

It's business as usual out the back of the machine — TV output, cassette sockets, edge connector and 9v DC power socket are exactly where you'd expect them to be.

A reset button — the only **genuine** mod on the whole machine — which simulates switching the power supply off and on.

Two plastic feet can be folded down from the base, tipping the Spectrum+ to a suitable typing angle (for those who can't afford an Interface 1).

The new machine also heralded the end for the *Horizons* tape — the enclosed intro tape for the Plus contains some very flash software, although it's mostly fancy logos and screen clears. There's a long keyboard tutor on side one, which seemed a bit simplistic under all the wrapping (and had at least one obvious bug) and the other side contains two simple games and a nice character generator (which can be used to alter the graphics in one of the games).

But, of course, software's not really a problem because, apart from the thousands of commercial programs already on the market, the Plus has six tapes bundled in with it; the one-time best-sellers and members of the 'Spectrum Six Pack' are *Scrabble, Make-A-Chip, Chequered Flag, Chess, Tasword 2* and *Vu-3D*. And that little lot should be more than enough to keep a new owner quiet!

MARKET FORCES

The Spectrum+ is quite openly a bit of traditional marketing. Every once in a while a product's fluffed up and offered at a little bit more than 'last year's model' — hardly Sinclair Research-style, but who can blame them in this day and age? It's obvious that Sinclair Research must be suffering lost micro sales along with everyone else this year, that and the components costing more at the moment. There's also the fact that the going will be a lot tougher, starting this Christmas.

But the price of the Plus is still a bit shocking! Sinclair Research could have taken a bit more time and effort to produce a machine it's *worth* upgrading to. Of course, Sinclair Research can't do a *very* enhanced Spectrum (say, with CP/M ability) as the product would more than likely knock spots off the QL. So what we get instead is a rather limp marketing ploy and a return to old Spectrum prices. And while I'm on this tack, you'll notice that the idea of a 16K colour computer for under £100 has been quietly dismissed.

I suppose I'm disappointed. Something around the size of an Apple II with a Fuller-style (*Who? What! Ed,*) keyboard would be a good start; a spare RS232 port could be used for a proper detached keyboard if the user wanted. The system should be capable of total compatibility with existing software but would include lots of extras, such as 16K pages of RAM below Basic and Interface 1 ROMs; these pages could be used for development software and so on, and switched off when full compatibility is required.

RGB and composite video ports are obligatory, and several expansion slots would be really appreciated (maybe Sinclair Research should have taken a peep at the USP system from U-Micros). You could then offer floppy controllers, 80 column boards, extra RS232 and Centronics ports and so on and so on.

Such a machine would have a lot going for it. Few people would mind paying around £400 for a starter system — it becomes the number one Spectrum development tool and also a viable business system. With the Spectrum's current software and user base, it would seem to make a *lot* of sense.

OK, the Plus does look good and, when you consider the current industry support for the existing Spectrum, seems set to be with us for many years to come. That's not such a bad thing — the Spectrum has done a great deal to promote the art of programming and the Spectrum+ will no doubt follow the tradition. I suppose we should be grateful it didn't come with its own kludge . . . YS

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SPRITE DESIGNER

***User-defined sprites on the Spectrum? It's not that difficult! Get things moving on-screen with more machine code magic from* Toni Baker.**

This month's block of crafty code makes wierd shapes fly around all over the screen. In fact, you shouldn't find it too hard to add a few bits and pieces to the idea yourself. It's all basically very simple. You design up to five different sprites — of any figure, shape, design and so on — which in this case are 16 pixels wide by 16 pixels high; imagine four user-defined graphics characters glued together in a square and you have the idea. But — and this is where the story really begins — there's more to this program than meets the eye, for it incorporates a rather mind-blowing idea . . .

MOTION PICTURES

You see, once you've defined a sprite, you can then specify its co-ordinates on the screen and its *velocity* across the screen. In other words, they move! Curiouser and curiouser. Once a sprite is set in motion, you can continue executing more Basic or machine code. The sprites will keep moving on-screen, simultaneously with any other program.

One line of Basic can set a sprite in motion. The next Basic line will, of course, be executed in sequence — but it'll be executed whilst the sprite is moving. Thus, the setting in motion in the first place is all you have to worry about. How it all works is quite intricate, so I'll explain in a moment or two; if you find the blurb a bit too heavy-going, try quaffing a cuppa or two before attempting to follow it. In the meantime, I'll tell you how to integrate my machine code with your Basic.

DOWN TO DESIGN

The first statement of your Basic program must be a 'DIM sS (x,8)'; where x is the maximum number of things you want flying around on-screen at any one time. Then, you'll want to include the statements 'LET on=33013' and 'LET off=33020'. From here on in it's up to you. The statement 'RANDOMIZE

CODE	ASSEMBLER		COMMENTS
		ORG 80F5	
3E80	ON	LD A,80	
ED47		LD I,A	I:=80
ED5E		IM 2	Activate interrupt routine.
C9		RET	
ED46	OFF	IMO	Deactivate interrupt routine.
C9		RET	
0181	IADDR	DEFW 8101	Direct interrupt control to address 8101.
F5	SPRITES	PUSH AF	
C5		PUSH BC	
D5		PUSH DE	
E5		PUSH HL	
DDE5		PUSH IX	Stack all registers used by the routine.
DD2A4B5C		LD IX,(VARS)	Point IX to array s$.
DD7E00		LD A,(IX+00)	
FED3		CP D3	
200F		JR NZ,EXIT	Jump if first variable is not array s$.
DD4604		LD B,(IX+04)	B:= first dimension of array (number of sprites).
C5	SP_LOOP	PUSH BC	Stack this number.
010800		LD BC,0008	
DD09		ADD IX,BC	Point IX to start of next sprite data (next element of array).
CD7181		CALL NXT_SPRT	Treat next sprite.
C1		POP BC	B:= remaining number of sprites to treat.
10F4		DJNZ SP_LOOP	
DDE1	EXIT	POP IX	
E1		POP HL	
D1		POP DE	
C1		POP BC	
F1		POP AF	Restore all registers.
FF		RST 38	Carry out normal interrupt procedures.
C9		RET	
CB0C	LINE	RRC H	
CB0C		RRC H	
CB0C		RRC H	HL:= coded print position.
011F00		LD BC,001F	
09		ADD HL,BC	Move print position one square down and one square left.
CB04		RLC H	
CB04		RLC H	
CB04		RLC H	HL:= correct print positon.
C9		RET	
CD4081	WIPE	CALL H_WIPE	Erase top half of sprite.
CD2981		CALL LINE	Point HL to bottom half of sprite.
CD4481	H_WIPE	CALL Q_WIPE	Erase one square of sprite.
23		INC HL	Point HL to remaining square.
E5	Q_WIPE	PUSH HL	
0608		LD B,08	B:= Number of rows per square.
3600	WP_LOOP	LD (HL),00	Erase next row.
24		INC H	Point HL to next row.
10FB		DJNZ WP_LOOP	
E1		POP HL	
C9		RET	
AF	TEST	XOR A	A:=00.
CD5581		CALL H_TEST	Test upper half of sprite position.
CD2981		CALL LINE	Point HL to lower half.
CD5981	H_TEST	CALL Q_TEST	Test one square of sprite position.
23		INC HL	Point HL to remaining square.
E5	Q_TEST	PUSH HL	
0608		LD B,08	
B6	TS_LOOP	OR (HL)	If any pixel is set then A becomes non-zero.
24		INC H	HL points to next row.
10FC		DJNZ TS_LOOP	
E1		POP HL	
C9		RET	

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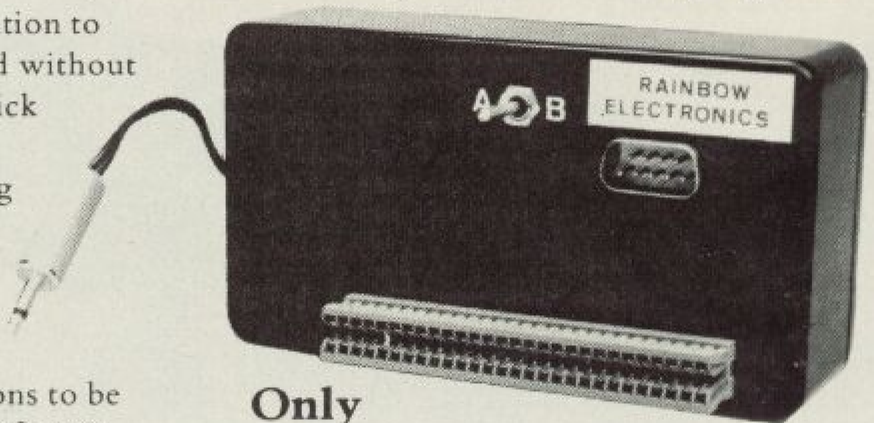
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SPRITE DESIGNER

USR on' will bring the moving sprite facility into action, whereas the statement 'RANDOMIZE USR off' will bring things back to normal.

The sprites themselves are defined using the ordinary user-defined graphics. You can have up to five different designs on-screen at once, which are:

Sprite 1=UDGs A,B,C,D
Sprite 2=UDGs E,F,G,H
Sprite 3=UDGs I,J,K,L
Sprite 4=UDGs M,N,O,P
Sprite 5=UDGs Q,R,S,T

You can define them yourself in the usual ways.

The array, s$, is the one that contains all the information, however, and each element must be precisely defined. Now . . . it's 'pay attention' time. Take a look at the box giving the explanation of the sprite parameters. (Note that in the explanations given, I've used the letter 'N' to represent one of the strings in s$; the number is completely arbitrary.)

The element s$(N,8) is actually very important. If it contains any character whose code is less than or equal to 64 (decimal), then the sprite is said to be *inactive* — that is, it'll not appear on the screen. You can make as many alterations as you like to the other elements of s$. Once all the alterations have been made, you can then alter s$(N,8) and the sprite will be *active* and will start moving across the screen.

If such a moving sprite collides with anything on-screen, or if it hits the edges of the screen, then it'll instantly stop

THE SPRITE PARAMETERS

STRING ELEMENT	EXPLANATION
s$(N,1)	CHR$ (the sprite number — between one and five).
s$(N,2)	This must always be initialised to CHR$(1).
s$(N,3)	CHR$ (the number of frames between successive movements).
s$(N,4)	CHR$ (the figure's Y co-ordinate).
s$(N,5)	CHR$ (the figure's X co-ordinate).
s$(N,6)	CHR$ (the figure's vertical displacement each time it moves).
s$(N,7)	CHR$ (the figure's horizontal displacement each time it moves).
s$(N,8)	This must be set last of all, and must be any character whose code is greater than 64.

In the table above, it must be noted that 'N' is used to represent one of the strings in s$ — the number is abitrary.

78	FIND_ADDR	LD A,B	This subroutine computes in HL the print position of the square (on the screen) which has PRINT-AT co-ordinates given by registers B,C.
E618		AND 18	
F640		OR 40	
67		LD H,A	
78		LD A,B	
0F		RRCA	
0F		RRCA	
0F		RRCA	
E6E0		AND E0	
B1		OR C	
6F		LD L,A	
C9		RET	
DD7E07	NXT_SPRT	LD A,(IX+07)	A:= activation flag.
FE40		CP 40	
D8		RET C	Return if sprite inactive.
DD3501		DEC (IX+01)	Count frames between movements.
C0		RET NZ	Return if the sprite does not require moving.
DD7E02		LD A,(IX+02)	A:= frame interval between movements.
DD7701		LD (IX+01),A	Re-initialise frame count.
DD4603		LD B,(IX+03)	B:= y co-ordinate.
DD4E04		LD C,(IX+04)	C:= x co-ordinate.
CD6281		CALL FIND_ADDR	HL:= print position of sprite.
CD3A81		CALL WIPE	Erase sprite.
DD7E03		LD A,(IX+03)	A:= y co-ordinate.
DD8605		ADD A,(IX+05)	A:= intended y co-ordinate.
FE17		CP 17	
301F		JR NC,NS_EXIT	Jump if intended y co-ordinate out of range.
47		LD B,A	B:= intended y co-ordinate.
DD7E04		LD A,(IX+04)	A:= x co-ordinate.
DD8606		ADD A,(IX+06)	A:= intended x co-ordinate.
FE1F		CP 1F	
3014		JR NC,NS_EXIT	Jump if intended x co-ordinate out of range.
4F		LD C,A	C:= intended x co-ordinate.
C5		PUSH BC	
CD6281		CALL FIND_ADDR	HL:= intended print position.
CD4E81		CALL TEST	Test for collision.
C1		POP BC	BC:= intended co-ordinates.
A7		AND A	
2008		JR NZ,NS_EXIT	Jump if sprite has hit something.
DD7003		LD(IX+03),B	Store new y co-ordinate.
DD7104		LD (IX+04),C	Store new x co-ordinate
180A		JR NS_DRAW	
DD360700	NS_EXIT	LD (IX+07),00	Deactivate sprite.
DD4603		LD B,(IX+03)	B:= old y co-ordinate.
DD4E04		LD C,(IX+04)	C:= old x co-ordinate.
DD6E00	NS_DRAW	LD L,(IX+00)	L:= sprite type number.
2D		DEC L	L now in range zero to four.
2600		LD H,00	HL now in range zero to four.
29		ADD HL,HL	
29		ADD HL,HL	
29		ADD HL,HL	
29		ADD HL,HL	
29		ADD HL,HL	Multiply by 32d.
ED5B7B5C		LD DE,(UDG)	Point DE to graphic A.
19		ADD HL,DE	Point HL to required sprite graphics.
E5		PUSH HL	
CD6281		CALL FIND_ADDR	HL:= print position of sprite.
D1		POP DE	DE:= address of pixel information.
CDDB81	DRAW	CALL H_DRAW	Draw upper half of sprite.
CD8129		CALL LINE	Point HL to lower half.
CDDF81	H_DRAW	CALL Q_DRAW	Draw next square of sprite.
23		INC HL	Point HL to next square.
E5	Q_DRAW	PUSH HL	
0608		LD B,08	
1A	DR_LOOP	LD A,(DE)	
77		LD (HL),A	Print next row.
13		INC DE	
24		INC H	Point HL to next row.
10FA		DJNZ DR_LOOP	
E1		POP HL	
C9		RET	

moving and deactivate. Element sS(N,8) will automatically reset to CHRS(0). You can test for this occurrance in a Basic program.

A TIMELY INTERRUPTION

OK, it's tea-break time! Arm yourself with a cuppa and I'll explain how it all works.

The machine code is an *interrupt* routine. This means that the program runs itself automatically 50 times a second. Each time it runs it checks out the array sS and shuffles sprites around the screen accordingly. The Basic instruction 'RANDOMIZE USR on' simply activates this interrupt procedure, whereas 'RANDOMIZE USR off' deactivates it. Interrupt procedures are quite clever; however, it's very easy to muck things up and just a tiny little bug will spell total disaster and blast the poor Speccy into oblivion. This is true simply because the program runs itself once for every new TV frame, whether you want it to or not.

Take a peek at the Basic program that's lying around in this article. It manages to do in just a few statements what would otherwise have been quite a complicated program; it produces a figure which bounces around the screen. The first seven lines just initialise the array, sS, and line 80 starts things moving. Line 90 is the one to think about — it looks like an infinite loop, but in fact it's not; it's just waiting until the figure hits an edge. If you break out of the program at any time you'll notice that the figure will keep moving *even* while you type a command, until it hits a wall (when it will stop). At this point, you should type 'RANDOMIZE USR off' before you do anything else.

`10 DIM s$(1,8)`	Dimensions the array, sS.
`20 LET on=33013` `30 LET off=33020`	Initialise the variables.

`40 FOR j=1 TO 8`
`50 READ a`
`60 LET s$(1,j)=CHR$ a`
`70 NEXT j`
	Read the data in line 160.

`80 RANDOMIZE USR on`	Switches the sprite facility on.
`90 IF s$(1,8)="A" THEN GO TO 90`	Waits until a sprite hits the edge of the screen.
`100 LET y=CODE s$(1,4)`	'y' is the Y co-ordinate of the sprite.
`110 LET x=CODE s$(1,5)`	'x' is the X co-ordinate of the sprite.
`120 IF y=0 OR y=22 THEN LET s$(1,6)=CHR$ (256-CODE s$(1,6)): BEEP .03,24`	Reverses the Y movement of the sprite if necessary.
`130 IF x=0 OR x=22 THEN LET s$(1,7)=CHR$ (256-CODE s$(1,7)): BEEP .03,12`	Reverses the X movement of the sprite if necessary.
`140 LET s$(1,8)="A"`	Reactivates the sprite.
`150 GO TO 90`	A loop to send the action back to line 90.
`160 DATA 1,1,2,10,5,255,1,65`	Contains the data for sS.

The Basic program to get things moving on-screen — type it in and see . . .

Well, that's it for this issue. I'm just going off to stick my head in a bucket of inspiration — hopefully in time for me to produce yet more gems next month. See you then. YS

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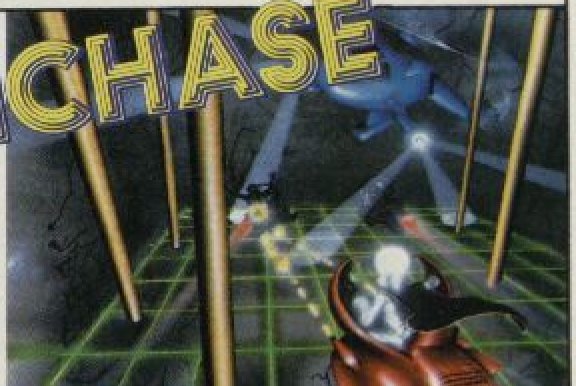


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YS MEGABASIC TUTORIAL

PROCEDURAL PRACTICE

Mike Leaman *shows you how to structure your programs in* YS MegaBasic. *And, at last, there's an opportunity to be first in the queue for the program itself!*

From looking around at other Basics for home computers — sort of sounding out the opposition, if you like — one aspect I was particularly keen to incorporate in *YS MegaBasic* was a means of helping users to structure their own programs. The 'experts' are constantly suggesting that you should structure your Basic for efficiency, but ZX Basic is hardly conducive to that!

However, I'm more than happy to report that a *YS MegaBasic* program *can* be written in structured sections — called 'procedures'. The main advantage is, of course, that each separate procedure can be tested on its own *before* it's added to the main program. Another useful aspect of working in procedures is that you can name each one; although you may understand each separate subroutine call in one of your own programs, it's not always true that it'll be a piece of cake for someone else who's attempting to debug it later. Using my system of structuring your programs each procedure has a name allocated to it — which should ideally describe its true purpose within the main program. Then, when a particular section is to be executed, all you have to do to bring the procedure into play is to use the name of the section in a program line — as opposed to using a GO SUB statement which doesn't give you any clues as to what's going on!

UP THE ORGANISATION

In *YS Megabasic*, the start of a procedure is defined by a '@' symbol along with its specific title — then, if required, this is followed by an underline character and a list of parameters. Note that all the procedure names are converted to upper case letters, and that any existing Basic commands can't be used to specify the procedures, so don't call a procedure 'PRINT' . . . use a bit of imagination!

A number of other Basics which include the use of procedures also allow the use of 'local' variables. With that system, variables used within a procedure don't affect the value of the variable of the same name outside that procedure. I'm sorry to say this is not available with *YS MegaBasic*, so take care when choosing the names of each procedure's variables.

A procedure's end is defined by the command ENDPROC; when a program encounters the ENDPROC command, processing is continued from the statement after the procedure call. Note too that the procedure name can be tagged on to the end of the ENDPROC statement to aid the program's legibility, so 'ENDPROC_DISPLAY' would define the end of the procedure 'DISPLAY'.

I've already mentioned in passing that parameters can be passed to procedures. This system of 'parameter passing' allows values to be assigned to variables at the beginning of a procedure for use in the rest of the procedure.

STACKING THE ODDS

Yet another feature of *YS MegaBasic* is the inclusion of the REPEAT ... UNTIL structure. The REPEAT command marks the beginning of a loop and UNTIL signifies its end. The UNTIL command is always followed by an expression — if this expression is false then a jump is made to the statement after the last REPEAT command and, if it's true, then program execution continues from the statement after the UNTIL command.

```
9000 @DISPLAY_A$
9010 DIM Z$(64)
9020 LET Z=(64-LEN A$)/2
9030 LET Z$(Z TO )=A$
9040 PRINT 'CHR$ 1;Z$
9050 ENDPROC_DISPLAY
```

This example program can be used to print a string on-screen in the centre of a line using the procedure 'DISPLAY_A$. For example, 'DISPLAY_"YS MegaBasic"' is equivalent to the ZX Basic 'Let A$="YS MegaBasic": GO SUB 9010'. Which one would *you* prefer to use?

```
10 REPEAT
20 OUT 254,RND*7
30 UNTIL_INKEY$="z"
```

This *YS MegaBasic* listing causes the border to flash until the 'Z' key is pressed.

```
10 OUT 254,RND*7
20 IF INKEY$<>"z" THEN  GO T
O 10
```

Now look at the bog-standard ZX Basic equivalent — frightening isn't it!

```
  10 MTASK_9000
  20 FONT_0
  30 PRINT "Task 1 ";
  40 GO TO 30
9000 CURRENT_0
9010 FONT_1
9020 PRINT "Task 2 ";
9030 GO TO 9020
```

This program causes 'Task 1' to be printed in window 2 using the standard Spectrum character set, and 'Task 2' to be printed in window 0 using the alternate character set.

Both procedures and the REPEAT ... UNTIL commands use a stack to store line and statement numbers. So that when a procedure is called, the line and statement number of the command after the call is placed on the stack — then, when an ENDPROC command is executed, the value is removed from the stack. When a REPEAT command is executed, the value is removed from the stack. When a REPEAT command is processed, the line and statement number are placed on the stack (something similar to a procedure call). When UNTIL is executed, if the expression is true, then a value is removed from the stack and program execution continues as normal. But if the expression is false, the top value from the stack is copied and a jump is made to the correct statement.

REPEAT ... UNTIL loops and procedures can be nested together. There is more than enough room on the stack for 10 values, but if you try to place more than 10 values on the stack you'll get a 'PROC stack overflow' error message. Likewise removing a value from the stack when it's already empty produces a 'PROC stack underflow' error message.

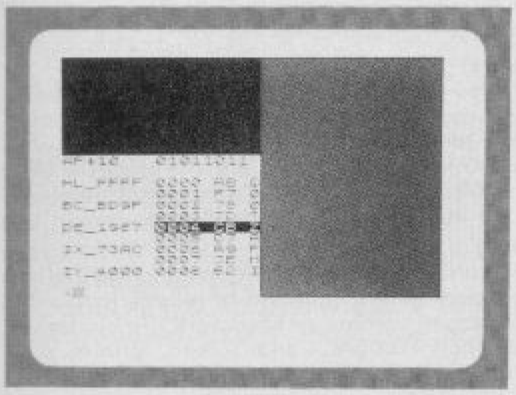
There are three commands to alter the stack without causing a program jump: POP, PUSH AND PCLEAR. POP is used to remove a value from the stack, PUSH specifies the statement and line numbers to be placed on the stack, and PCLEAR clears the stack; the command PCLEAR should always be used at the beginning of any programs involving the use of procedures or REPEAT ... UNTIL loops in order to prime the stack.

GO WITH THE FLOW

There are two commands that can affect program flow — these are MTASK and BRANCH. MTASK provides the Spectrum with a simple form of multi-tasking; it splits a program into two parts, executing a line from the first part and then a line from the second. This 'multitasking' continues until either one part of the program finishes or it's turned off. MTASK is always followed by a number which defines the start line of the second part of the program (the first part of the program is assumed to continue after the MTASK command). If you want to turn it all off, execute MTASK 0. Both sections of the program must use the same variables, but each can access different windows and character sets.

The second command, BRANCH, causes a jump to be made to a subroutine after a line has been finished. Bear in mind though that MTASK has priority over BRANCH, so if you want to multitask, don't try to branch as well. The number after the BRANCH command specifies the line number at which the subroutine starts; the subroutine is terminated by an ENDPROC statement. You'll find branching especially useful when debugging a program; take, for example, when a programmer wishes to monitor the value of a particular variable during the execution of a program, this is when a BRANCH subroutine can be used to display its value. YS

YS MEGABASIC OFFER!



YS MegaBasic will be available from 1st January 1985 for just £7.95 — and that's at least £2 less that it'll cost you if you wait for it to hit the high street shelves. All you've got to do to get this massive price reduction is to fill out the form below, attach the *YS MegaBasic* tokens (or photocopies of same) from issues 8 and 9, and send us a cheque/Postal Order (made out to Sportscene Specialist Press Ltd) for £7.95.

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YS1284

WD Software

QL Utilities (£10 on Microdrive)

This package offers single-key loading, running or deletion of files, multiple formatting of cartridges to another with optional over-writing of namesakes. In addition, a directory of 60+ files can be viewed without screen overflow. NB a VERIFY program is unnecessary — QDOS does this automatically. Now includes directory print-out and "qprint" to print any or all files on a cartridge with optional dated titles. Owners of the earlier package can update by sending OUR cartridge and 25p.

Current Spectrum Software

Tradewind (£5 cassette)
Buy a ship, provisions and cargoes to trade between the harbours of the Coral Islands. Make a fortune if the weather and pirates let you live long enough to master seamanship and economics. A strategy/adventure game with graphics for 48K.

Jersey Quest (£5 cassette)
Following an accident, you are stranded in the labyrinth of time and must find you own way back to the present with the aid of persons and objects from Jersey Folklore. Meet the Black Horse of St Ouen, the Dragon and Knight of La Hougue Bie, the Black Cat of Carrefour a Cendre, the Witches of Rocqueburg and many others. A text-only adventure for 48K in machine code (Quill).

Morse Tutor (£4 cassette)
This one has it all! 4-19 words/minute, variable spacing, variable number of groups of random letters, numbers or mixed, random sentences, own message, single characters (including punctuation), variable pitch FEEDBACK via screen, printer or SPEECH (phonetic alphabet via Currah u-Speech on 48K version only), and repeat facility. Takes you to and beyond RYA and Amateur Radio receiving standards. 16K and 48K versions on one cassette, 48K only on Microdrive cartridge.

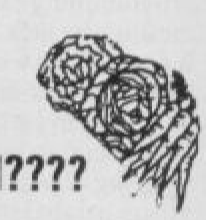
Spectrum Programs on Microdrive

All the above are available on Microdrive cartridges at a price of £4.50 for one cartridge + the price of each program as shown above, e.g. a cartridge with Tradewind and Morse Tutor would be £13.50. As a BONUS, Gavin Monk's Indexed Loader is included FREE with each cartridge.
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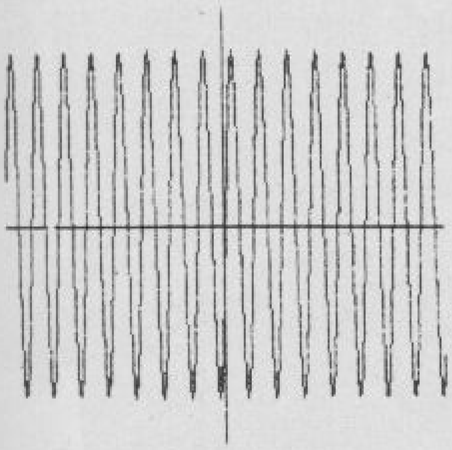
The printer comes in a slim matt plastic case, which will compliment your Spectrum. It connects with the Spectrum via a 56-way ribbon cable and all connections are brought through to the back of the printer.

The printer has two switches — one for paper feed and one for on/off line.

3 PRINT MODES

GRAPHICS MODE

```
Full graphics capability is available
in the Graphics Mode:
```



SINEWAVE

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```
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    - the Graphics Mode,
    - the Adjust Mode,
    - and the List Mode.

and three special features:
    - double height,
    - double width,
    - and inverted printing.

In the Adjust Mode, the printing is
such that no split printing of words at
the end of lines occurs, and printing
is done with up to 40 characters per
line.
It is possible to mix the
double width and double
height features even within normal
text!
Inverted printing
is also possible!
```

LIST MODE

```
The List Mode allows BASIC programs to
be more easily read by indenting the
program statements from the
corresponding line numbers:

 360>REM This is a program to plot any
     required trigonometric function.
     The period and magnitude of the
     waveform can be specified by the
     user.
 368 CLS
 370 PLOT 0,87: DRAW 255,0
 380 PLOT 127,0: DRAW 0,175
 390 INPUT s,e$
 395 LET t=0
 400 FOR f=0 TO 255
 410 LET x=(f-128)*s/128: LET y=VAL e$
 420 IF ABS y>87 THEN LET t=0: GO TO
     440
 425 IF NOT t THEN PLOT f,y+88: LET
     t=1: GO TO 440
 430 DRAW 1,y-old y
 440 LET old y=INT (y+.5)
 450 NEXT f
 460 RETURN
```

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AUTOMATA PRESENTS

DEUS EX MACHINA

Deus Ex Machina *may be an innovation — bringing a touch of Hollywood to your screens — but what of the game itself? Is it a game anyway?!* Ross Holman *auditions Automata's rising star, providing out-takes from its screen test.*

Deus Ex Machina is not just a game, it's a visual and aural experience. The idea is not unlike that of the 'concept' LP, where you're supposed to follow a theme from beginning to end. The theme in this case is the growth, birth, ageing and death of a mutant generated by an all-powerful computer. The initial process of creation is in fact brought about via a lump of mouse dropping; you as the player have to nurture and guide this freak organic accident through its life cycle.

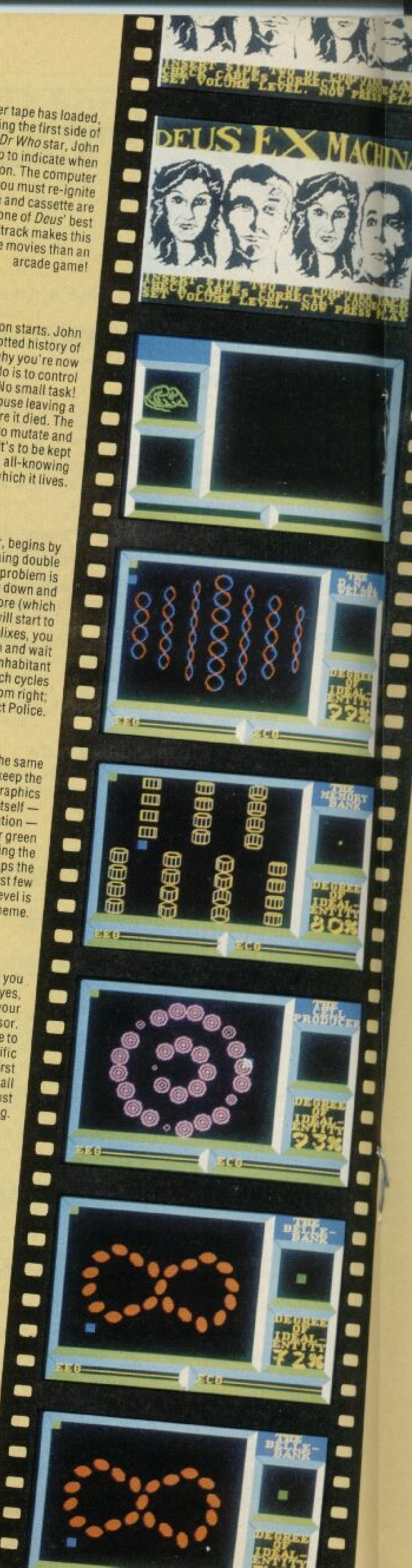
For *only* (?) £15 you'll lay your hands on a very large plastic box containing two cassettes and a large poster. Cassette one provides the computer games, while the other has the accompanying soundtrack. On the reverse of the poster is a brief description of how to load the game and the control options. The game is Kempston and Interface 2 compatible but so easy to control that just using the keyboard alone is not difficult. The poster also offers a complete transcript of the songs and narrative, along with an explanation of each game and pictures of all the celebrities who appear on the tape.

Automata describe the game as 'an animated televised fantasy' and as the union of computer game, film, book and LP is perhaps stretching it a bit. Still, the company is obviously proud of its latest release, and justly so. It's produced maybe 70K of machine code games, all synchronised to a music and narrative cassette, featuring the likes of Frankie Howard, Jon Pertwee, Mel Croucher, Donna Bailey and Ian Dury. All in all it's a slickly produced and presented piece of software which has clearly had a lot of time and effort spent on it. The question is, does it makes for an appealing game?

EASY MORALS

Automata certainly seems keen to get across the idea of genetics and dangers inherent in experimenting in this field; any other ideas or messages that may appear to lie within the game are strictly up to the individual to find. As for games content, well, the games are not too difficult to play and getting to the end is easy. On the other hand, I'm sure that this is deliberate. The idea of synchronising game and soundtrack is new and works well, but the appeal soon wears off; eventually, I found myself playing the game without any audio assistance at all!

If *Deus Ex Machina* appeals to you then maybe it's worth the £15 price tag to own what's potentially an interesting chunk of computer history. But don't expect it to knock your socks off.



Once side one of the computer tape has loaded, you're told when to start playing the first side of the soundtrack cassette. Ex-*Dr Who* star, John Pertwee counts down to zero to indicate when you should hit the 'pause' button. The computer now counts down to zero and you must re-ignite the audio tape. Eureka! Game and cassette are now synchronised. This is one of *Deus'* best features; the audio soundtrack makes this program more like a night at the movies than an arcade game!

This is where the animation starts. John Pertwee takes you through a potted history of how the 'accident' occured and why you're now playing the game. All you have to do is to control a mutant through its weird 'life'. No small task! Apparently, it all began with a mouse leaving a small organic present just before it died. The lump of mouse dropping began to mutate and your protection is required if it's to be kept secret from the all-thinking, all-knowing machine in which it lives.

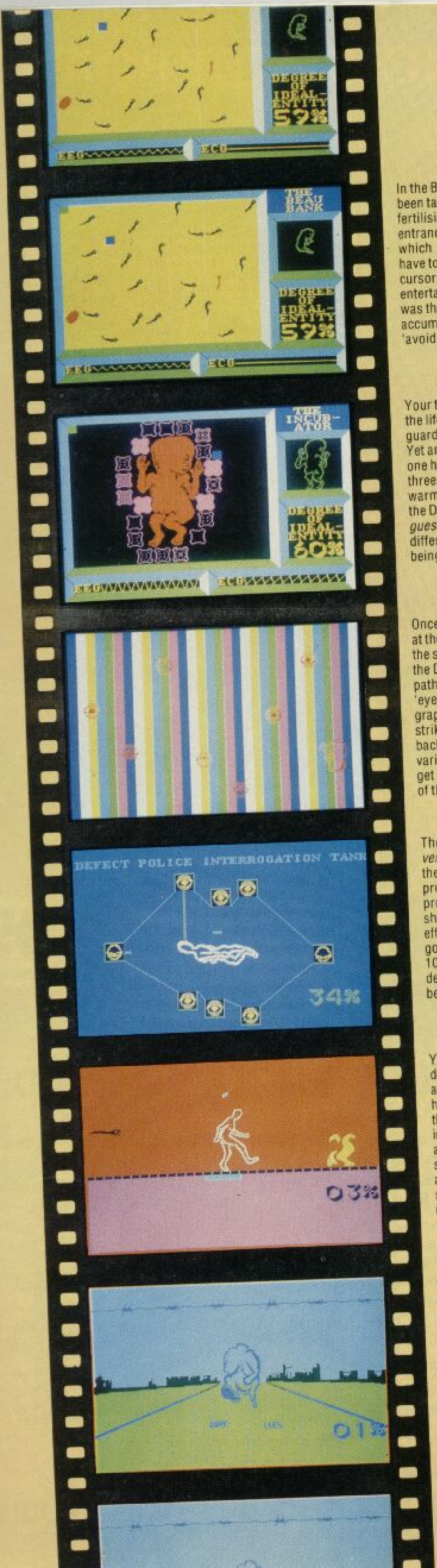
Game one, The DNA Welder, begins by confronting you with some spinning double helixes (representing DNA). The first problem is to prevent them from slowing down and stopping; if this happens, your score (which starts at 99 per cent normality) will start to decrease. To speed up the spinning helixes, you have to guide a green cursor on to them and wait until it regains speed. The only other inhabitant of the screen is the blue cursor, which cycles down line by line, from top left to bottom right; this is the scanner of the Defect Police.

On this level — which is pretty much the same as the one before — you have to keep the rocking memory banks moving. The graphics are up to the standard *Deus* has set for itself — large characters, with very smooth animation — and once again, you have to use your green cursor to warm the banks up while avoiding the blue Defect Police probe. This is perhaps the biggest criticism of *Deus* — for the first few games, you *do* get the impression each level is going to be a simple variation on a theme.

More blue cursor stuff here. On this screen you have to keep the cells pulsating by — yes, you've guessed it — touching them with your green cursor while avoiding the blue DP cursor. As the soundtrack and computer game have to go hand-in-hand, all the games play to a specific time limit. I found that, especially on the first few levels where the variation in play is not all that spectacular, the games tended to be just that little bit too long.

IAN McKINNELL





In the Beau Bank (game five) a single egg has been taken by the machine and now needs fertilising. At this point, Ian Dury makes his entrance singing 'I'm a fertilising agent' — which is good news indeed for all the eggs. You have to guide the sperm by bouncing it off your cursor; this turned out to be the most entertaining of all the screens — for a start, it was the only one on which I could actually accumulate points! This game is one of the 'avoid the Defect Police cursor' series.

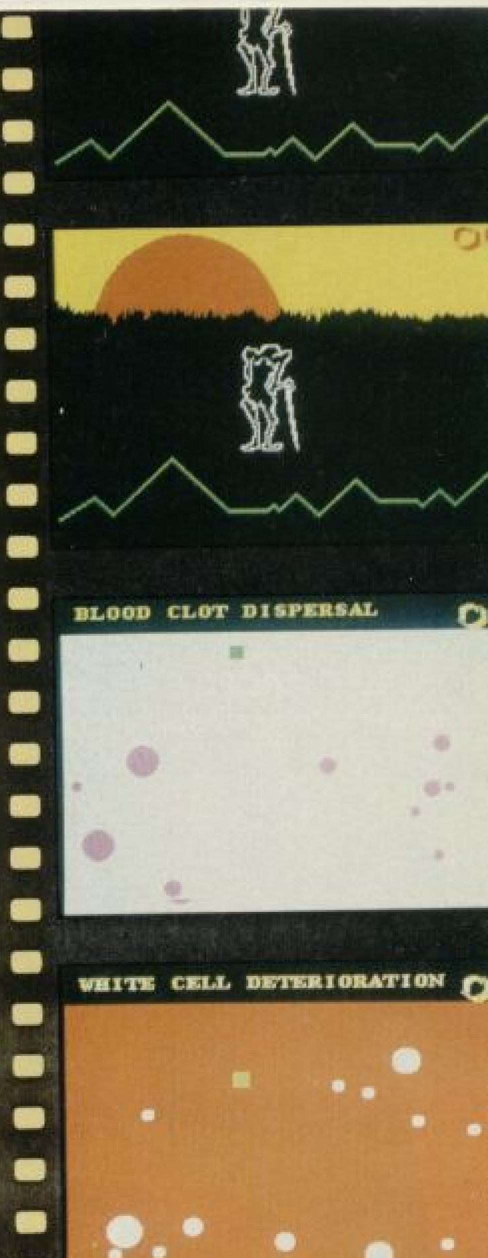
Your task inside the Incubator involves keeping the lifeform's cocoon intact; you do this by guarding and preserving its constituent parts. Yet another 'Defect Police cursor' game, this one has a slightly different twist from the first three games. This time you keep the cocoon warm and in its sea of pulsating cells, and avoid the Defect Police yet again (*Who'd have guessed! Ed.*). At least the lifeform looks a bit different (even if it does look more like a human being).

Once the infant's born, it's thrown into the world at the deep end . . . literally. You have to guide the spinning foetus through the probing eyes of the Defect Police and along a psychedelic pathway to safety. Each time your babe hits an 'eye', your normality score decreases; the graphics in this part of the game are quite striking, mainly due to the colours used for the background. Although I experimented with various techniques, there was no way I could get through this level without hitting at least one of the Defect Police's eyes!

The last two games on side one show the young, *very* human, lifeform spinning in the centre of the screen. Surrounding him (or her!) are probing eyes that emit psychic rays. For protection, you have to manoeuvre a small shield around the babe — thus nullifying the effects of the probes. I found that no matter how good your reactions were you couldn't achieve 100 per cent success and, as ever, the score decreases. (No sooner are you born than you begin to die!)

Your score is carried over into side two — so don't reset your computer; this is a slightly annoying feature as I'm sure many users would have preferred to have a 'save-game' option at this stage. The first two games on side two involve the now adult man running, jumping and avoiding the pitfalls of life. The action on-screen shows the figure under attack both from above and either side. It's time to whip out three shields, to block the path of the advancing nasties.

The next game is perhaps the most impressive, showing the middle-age creature lumbering towards the player — that is, out of the screen. At its feet are a number of words representing good and evil; the idea is to jump over the 'good' words like 'joy' and 'peace', while stamping on words like 'evil' and 'war'. It's not all that easy to judge when to jump and the creature seems to jump on its own at times(?). Each mistake causes some of your empire (which you see in the background) to collapse.



Once you've guided the scanner along the old creature's pulse you're thrown in the second part of the final section in which you have to stop the creature's blood clotting. You do this hitting the clotting cells with your cursor. On this game's over, you die. The game ends jus like a movie with the credits scrolling up the screen in the usual Hollywood fashion. As the soundtrack quietly fades into the background the computer resets with the Sinclair Researc copyright message and it's all over.

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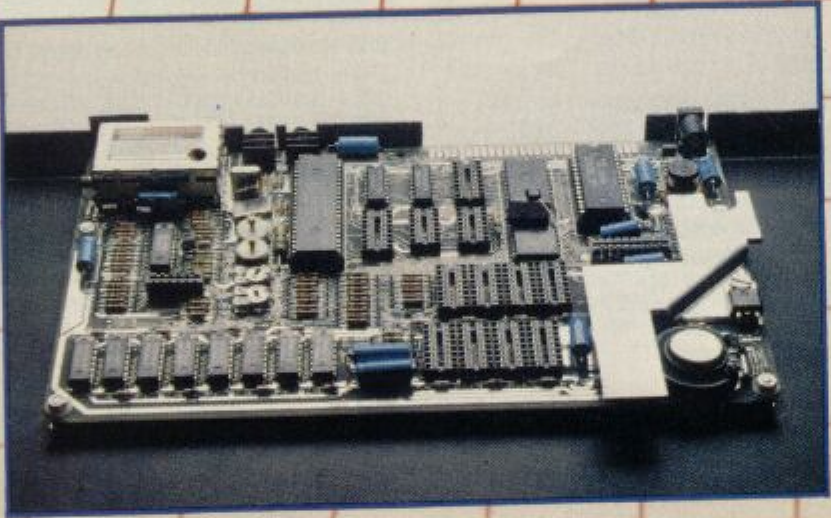
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HACKER'S GUIDE

Seasoned hacker,* Dave Nicholls *shuffles through* Deus' *code — and comes up trumps!

There have been many instances of companies claiming their games use programming techniques that are 'new' or which have 'never been used before' — but going by the ones I've seen, I can only assume that those concerned have never heard of Knuth's *Fundamental Algorithms* or any other classic programming books!

SOLID AS A ROCK!

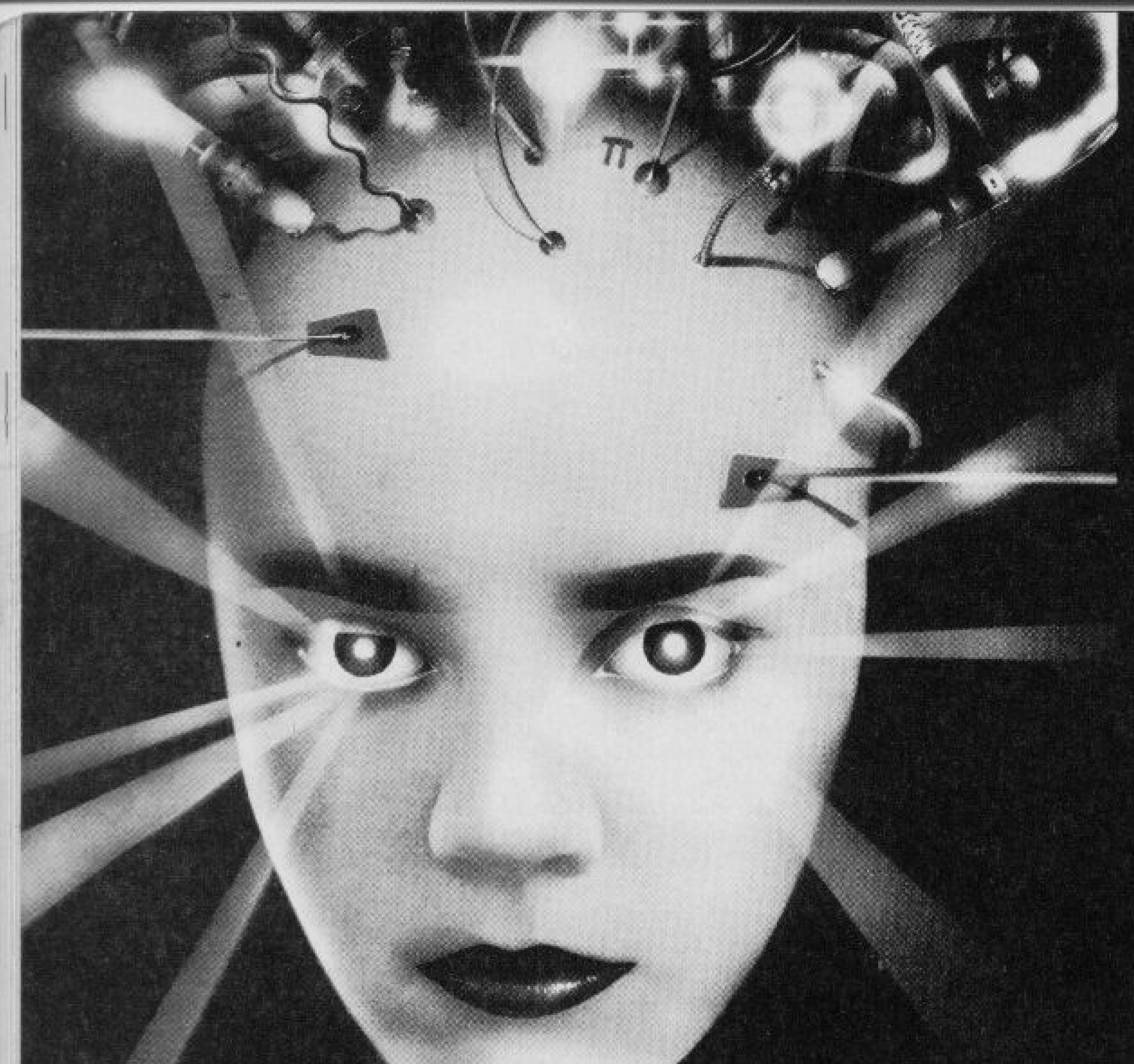
I've always maintained that, although innovation is a wonderful thing, there's no substitute for good, solid 'standard' programming when it comes to getting things done. This is where *Deus Ex Machina* really stands out. The concept of the music cassette is obviously new, but Andrew Stagg's coding for the games is virtually an object lesson in good programming. Any of you who've read my words of wisdom before (*Shame on you if you've missed them! Ed.*) will know that there are several coding faults in games programming that really get up my nose — the two major ones being self-modifying code (of which there's none in *Deus*), and large 'gaps' in between subroutines. On the latter score, *Deus* is amazing — it's so densely packed that when I needed to insert a small routine of my own, it took me about half an hour to find room for it!

One thing *Deus* does seem to have pretty much sussed is its use of interrupts. For those of you not in the know, this is the method of stopping the CPU periodically, making it jump to another program in a different location in memory. This is a relatively easy way to make a computer run more than one program at once (multi-tasking to you, John!). Spectrum interrupts occur 50 times a second and are normally used to scan the keyboard and update the FRAMES system variable ... but they can be re-directed to do other things, such as to provide a continuous tune throughout the game. This is obviously redundant in *Deus* (as it comes with its own soundtrack), so Andrew Stagg has used them to make the games stay in sync with the words/music tape. To this end, each game has a set of timing values used by the interrupt handler to inform the main code when things are due to occur; this is done by modifying a particular memory location which is checked repeatedly by the main program and used to work out which routine to run next. This is also used the other way round, so that the handler can run routines needed for a particular game; these routines are all of a fixed length so that they can be allowed for in the timing constants for the game. So, remember, next time you play *Deus* you're actually running two independent, but interacting, programs.

WHAT'S THE SCORE?

My final comments on *Deus Ex Machina* concern the scoring system. While hacking a game, I tend to play it quite a lot to get a 'feel' for what's going on. My efforts were rewarded with a consistent score of zero per cent. OK, so this isn't unusual for me, but I knew that Ross 'Magic Fingers' Holman was having the same problem ... so I decided to investigate. After much rooting around in the code, I soon found the answer.

For each game, you're given a percentage mark (however, this isn't the mark you see on-screen!) which is then used to reduce your current score — for example, if you score 60 per cent on a game then you'll lose 40 per cent of your overall score. Geddit? So that you don't lose points too quickly, each game has a limit below which your score cannot fall (for instance, all the games on side two of the cassette have a 50 per cent limit). However, as your maximum score is 99 per cent and an integer divide routine is used, you'll lose at least one per cent on each game (except for the Beau Bank where you get one per cent added for each fertilised egg). I can only think that Automata are trying to tell us that nobody's perfect!



AUTOMATA U.K. PRESENTS
YOURSELF
IAN DURY
JON PERTWEE
MEL CROUCHER
DONNA BAILEY
and FRANKIE HOWERD in

DEVS EX MACHINA

WRITTEN AND DIRECTED BY MEL CROUCHER

AUTOMATA thanks everyone who has taken DEUS EX MACHINA to their hearts . . . reviewers, wholesalers, retailers, the media, and most important of all, our public . . . THANK YOU !

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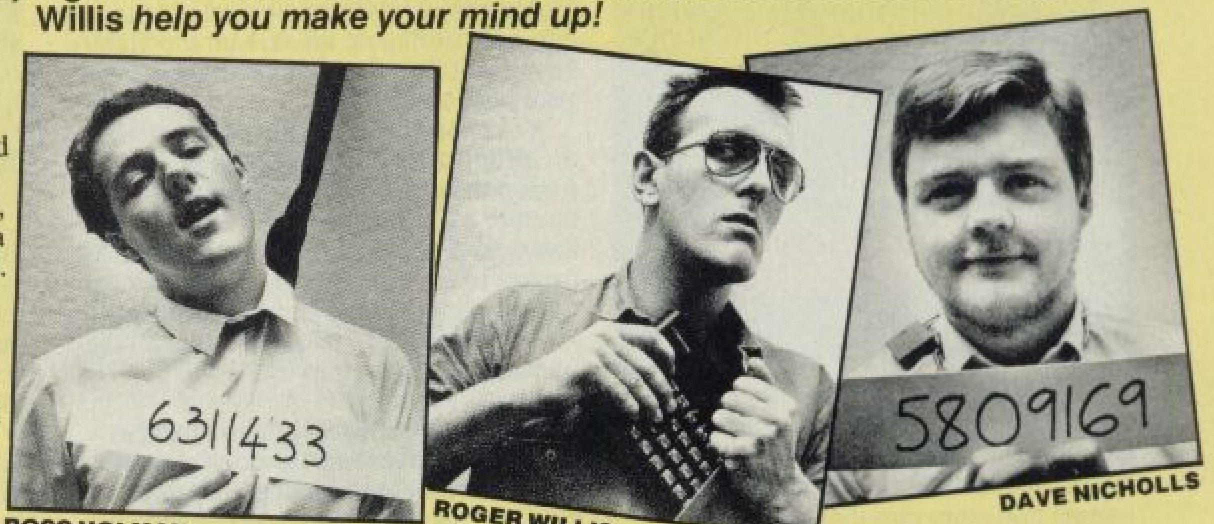
JOYSTICK JURY

What's on your software shopping list for Christmas? Let* Ross Holman, Dave Nicholls *and* Roger Willis *help you make your mind up!

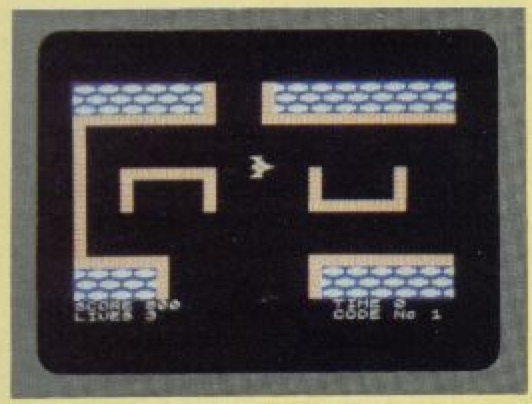
This month, our motley crew of Joystick Jurors include Dave Nicholls, a self-confessed adventure fanatic and seasoned hacker; Ross Holman, ace games player and winner of the *Jet Set Willy* prize; and, last but by no means least, Roger Willis, a relative newcomer to the Spectrum scene.

Dave and Ross you'll already know from our monthly major games reviews. Roger Willis, on the other hand, is probably more at home in the saddle of a massive motorbike ... but that was before he discovered the thrills and spills of the Spectrum.

Check out what they thought of the latest in games software ...



ROSS HOLMAN ROGER WILLIS DAVE NICHOLLS



THE PRIZE

Arcade Software/£5.50

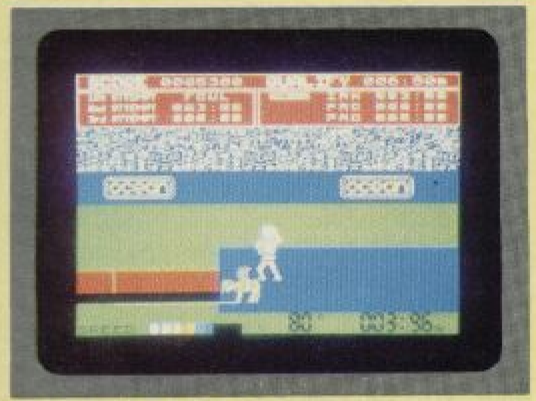
Dave *The Prize* is a variation on the maze theme. You have to control your spacecraft through the maze, collecting 'code pods' as you go. The pods are numbered and must be gathered in the correct order; reaching number five promotes you to the next level.

Those hitting the fourth level are asked to find the 'special code', photograph it, and send the evidence to Arcade Software. This entitles you to enter the competition that goes with the game. The competition has a prize (cunning title isn't it!) of £5000, but the catch is that the money will be divided between all the people who send in correct answers before January 1985.

On the game front *The Prize* is quite good, the maze is very large and your ship moves nice and smoothly. This is, however, really a game that will appeal more to cartographers than to shoot 'em up freaks. *2/5* **MISS**

Ross A very colourful maze game with a large prize for the winner. The nasties aren't that clever, so only the overall size poses a problem. It loses its appeal very rapidly. *2/5* **MISS**

Roger Being quite unable to imagine what five thousand folding green drink vouchers will look like stacked next to my keyboard and as I've never had that much wonga in my short and miserable life, I find it hard to imagine this game holding anybody's interest . . . *1/5* **MISS**



DALEY'S DECATHLON

Ocean/£6.90

Dave *Daley's Decathlon* is, of course, one of the several attempts to transfer the arcade game *Track and Field* onto the Spectrum. In fact, it's just about the best attempt so far. The object of the game (in case there's anyone out there who doesn't know!!) is to compete in each of the ten decathlon events scoring points for speed, height jumped and so on.

In the running events movement is accomplished, as usual, by either hitting two keys alternately or wiggling a joystick back and forth; a further key is used to throw or jump in the other events. Graphically, *Decathlon* is very good, the only problem being the rather stiff running motions of your man. Ocean's logo scrolls past at the top and a crowd applauds when you do well. Although there are a few small bugs (for example, I have it from a reliable source that it's possible to clear over 400 metres in the long jump!) the game simulates all of the events very well; including an energy limit on the 1500m.

For anyone on the look-out for a *Track and Field*-type game, this is the best buy at the moment. *4/5* **HIT**

Ross Certainly the best track and field game for the Spectrum, although it doesn't contain some of the nicer touches in other versions. *3½/5* **HIT**

Roger Put a few quid in a deserving *shamateur's* pocket. After all, our boy Daley must've flogged the right to use his name. Good luck to 'im, too, because *Decathlon* earns its keep in screen time and gave me a lot of much-needed exercise. *3/5* **HIT**



DELTA WING

Creative Sparks/£6.95

Roger This was the one that kept me up at nights — not that I broke any 'high scores'. *Delta Wing* is definitely a game for patient technocrats. It's based on only two screens, but these are complicated and composite. Simulator tendencies are confirmed by the continuous presence of cockpit instrumentation across the bottom. Altitude, air-speed, fuel gauge, radar and artifical horizon add in to a total of 14 informative variables to complement the pilot's hand moving the on-screen joystick according to player instruction.

All it takes is a tweak of the old handlebar moustache and there you are, blasting 'em out of the sky or bombing their bases. The second screen flashes up on request and is made up of a map showing your bases (which can be landed at for fuel and ammunition), their bases (which can be bombed), and the current position of enemy planes (which got me reciting 'Tally Ho' and 'Wizard Prang' epithets ...).

A significant attention span and a great deal of preseverance are vital though, because in this game nothing comes easily. Just taking off, involving correct ground speed related to flap position and timed pull-back on the joystick, is a thoroughly skilful operation. Being honest, I could barely get off the runway but I *felt* like an RAF pilot! *4/5* **HIT**

Ross Slightly simpler controls here than with other flight games. It's good and fast, but too similar to existing products to sell that well. *3/5* **MISS**

Dave This game drops in somewhere between the flight simulators and *Zzoom*. It's quite playable and easier to fly than most others of its type. If you want to fly, but don't want to be able to tell your flaps from your ailerons then this is the one for you. *3/5* **HIT**

JOYSTICK JURY



KOKOTONI WILF
Elite/£5.95

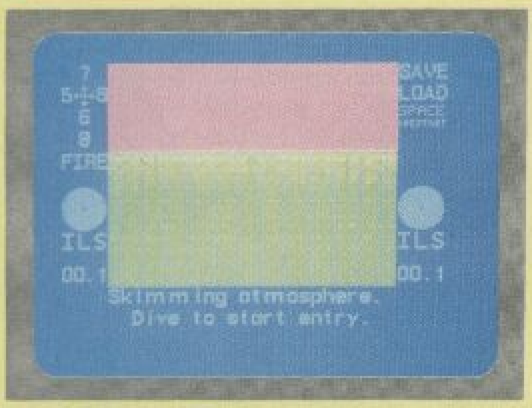
Ross Elite has taken the little white man out of the realm of the superhuman jumper and more into that of winged avenger; he's now a decidely unheavenly-looking angel! Wilf can be made to move left, right or flap up the screen; the 'flap' key repeats so you don't have to wear out your keyboard.

Kokotoni Wilf is a game of 60 screens divided into six time zones. To progress from one to the next, you have to collect a number of flashing pieces of an amulet — and then find a time gate. Incidently, Elite forgets to mention that you can start in any of the first three time zones by pressing keys '1-3' and then you'll find that all the objects on the previous levels will be credited to you.

Each screen consists of large fixtures like trees or dinosaurs (some of which may animate a little) and smaller, moving graphics. Tunnels and recesses have tended to replace the familiar platforms. The graphics aren't really up to *Jet Set Willy* standards and the difficulty I had controlling Wilf's spritely extravagances spoilt any appeal that the game had. *2/5* **MISS**

Dave This is a reasonable game with above average graphics, but it gets annoying after a while because the controls are not precise enough. Elite advertise this as the successor to *Jet Set Willy*. It's good, but not that good! *3/5* **HIT**

Roger Maybe 'Flapping Fred' would have been a better name, or perhaps 'Blundering Budgie', because our hero Wilf's mishaps can't all be blamed on Spectrum keyboard insensitivity. Shame 'cos there's enough screens to last a long time. *3/5* **HIT**



BRAXX BRUFF
Micromega/£6.95

Roger Mission Control, Houston, heaved a collective sigh of relief the day my careers master decided I was much too stupid to become a space pilot because — as this game finally proves — I would have been *very* bad at it. Nevertheless, tantrums at my inability to land the naffin' rescue pod on the planet Prolon were unavoidable. I couldn't get past the first *three* superb screens in *Braxx Bluff* ... who knows how many more I missed!

Moving 3D graphics are 'the biz' right from the beginning of this rescue mission. The screens I actually got at involve descending from the mother ship's orbit down to skimming the planet's atmosphere, before diving towards a landing — the point where you'll need fine stablising control to score sufficient points to achieve a safe descent.

Getting onto the planet and beginning the search for the three crewmen, trapped in a stranded hydro-crawler by alien lifeforms, means acquiring eight points during 'Lander Phase'. I only managed to clock a maximum of four and a bit ... All the same, expert space jockeys can move on to Walker Phase, Land-Crawler Phases, Sea-Crawler Phases and a finale where the Commander's 'enigmatic' boat race appears on-screen to say 'Ta very much' ... Pass the joystick, Gladys! *5/5* **HIT**

Ross Definitely a disappointment after the last few Micromega games. The 3D effect is not very awe-inspiring and the supposed finale is dull. If it didn't have a 'save to tape' facility, I wouldn't have played it for very long. *2/5* **MISS**

Dave The 3D graphics are unconvincing and the game is quite easy to beat. Even so, the last stage goes so long that I was just crashing into rocks on purpose for excitement! *1/5* **MISS**



BEATCHA
Romik Software/£6.99

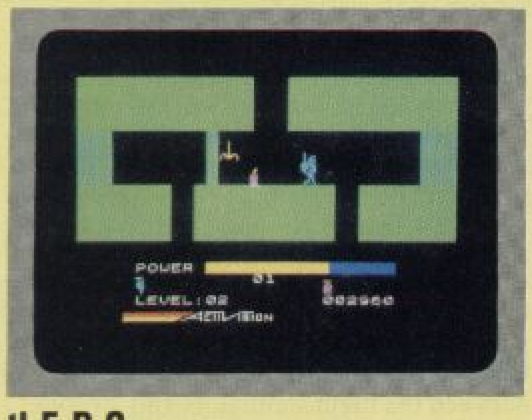
Dave At first glance, *Beatcha* looks a bit like *Gulpman*, which was one of the first *Pacman*-type games to come out on the Spectrum. It takes, however, a few more glances to realise just how similar they actually are!!

The object of the game is to move around various 'classrooms' and collect keys. When all the keys are collected you have to reach the main door and escape. Your man is a single cursor 'Smiley' face which moves at a ridiculous rate and is chased by unhappy little faces (the teachers) which in some cases move so fast that you lose several of your 26 lives before you can get out of the way. In fact the game's only redeeming feature is that there are quite a few classrooms to be killed in.

In short this game is about as much fun as a three-hour 'partly predictable' broadcast on behalf of any party you care to mention. It might make a useful dustbin filler. *0/5* **MISS**

Ross This is a standard maze-type game which proves difficult merely due to the speed and persistence of the chasers. I don't think it has much going for it. *0/5.* **MISS**

Roger Why did I used to fall asleep at school? Why does this game remind me of what fanciful commentators refer to as 'the best days of my life'? *Beatcha*, in relation to teacha(s), is as boring as the real thing. *1/5* **MISS**



H.E.R.O.
Activision/£7.99

Dave *H.E.R.O.* is a game in which, as the name implies, you get to play the hero — Roderick Hero to be precise. Roderick's job is to rescue trapped miners caught when Mount Leone erupted.

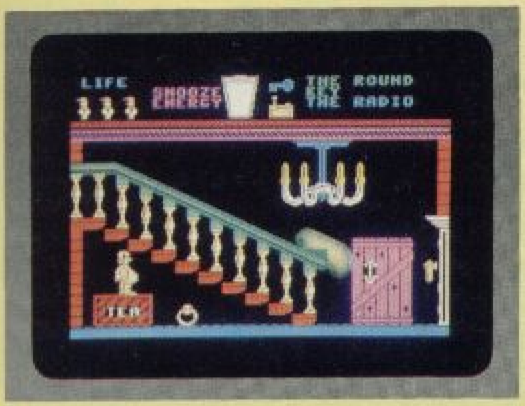
To help him he has a miniature helicopter thing strapped to his back which allows him to fly up and down the vertical shafts, a microlaser helmet for shooting nasties, and several sticks of dynamite which are capable of 'removing' any thin walls that happen to get in the way (if necessary the laser can also be used to break through walls, but this uses up a lot of power). As well as having to shoot his way past spiders, bats and other mine-dwelling creatures, Roderick also has to contend with lamps that can be put out by careless shooting or flying and, in the later stages, 'molten lava' walls that kill on contact.

Graphically the game is simple. The walls are large blocks, and the control of the backpack leaves a lot to be desired. But it *has* got that 'one more time' addictive quality that keeps you playing and, because after level 17 the mines are randomly generated, there's no way it'll be mastered. *4/5* **HIT**

Ross The delay on our hero's contraption makes control tricky — though not to a detrimental extent. But the plain blocky graphics for the cave walls are very dull. *2/5* **MISS**

Roger Wot is Roderick Hero doing with this 'rescuing miners' stuff? Doesn't he know the political consequences? Being an 'all-round Good Guy' does have its advantages and sleep inducement seems to be one of them, despite increasing difficulty. *1/5* **MISS**

JOYSTICK JURY



PYJAMARAMA
Mikro-Gen/£6.95

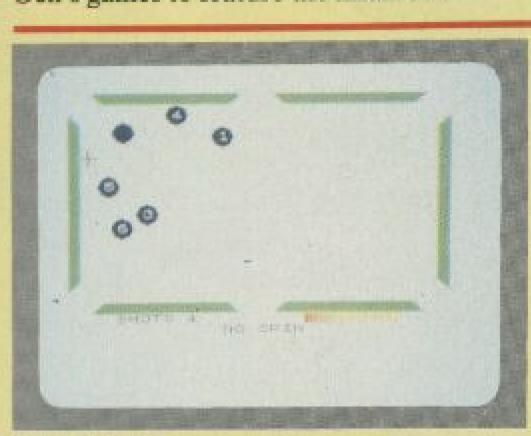
Ross *Pyjamarama* is the second of Mikro-Gen's games to feature the infamous 'Wally'. This time, our Wal' is having a nightmare (*He'd dreamt he'd just bought a CBM 64? Ed.*) and the only way he's going to be able to wake himself up is to find the key to his alarm clock and wind it into action. The setting for the game is Wally's home, each screen representing one room and each filled with beautifully drawn and coloured furniture. In a way that's similar to *Atic Atac*, you guide our sleeping hero through the rooms — this time seen from the side; just like *Jet Set Willy*, you can move left, right or jump. Only a few screens have things for Wally to jump on — chairs, tables or staircase.

Each room of Wally's house has a number of doors. Some can be opened just by jumping at the handle but to get through others you need to be carrying certain 'objects'.

You also have a limited amount of energy per life which decreases each time a moving graphic hits you ... so watch out for the hands which burst from the floor and grab you! Touches like this make *Pyjamarama* a humourous and enjoyable game. *4½/5.* **HIT**

Dave Mikro-Gen says you'll never dream a program could be this good, and for once the advert is right. It's worth buying for the games room. *5/5* **HIT**

Roger It's hard to play but easy to watch. Wally's nightmare won't put you to sleep — just the opposite. It's both pretty and pretty funny, err, if you know what I mean . . . *4/5* **HIT**



HUSTLER
Bubble Bus/£6.99

Ross Is there really a market for another pool game? Answer ... probably only if it's sufficiently different from the others to maintain interest. Bubble Bus must have recognized this because *Hustler* provides six different games to choose from.

Having selected your particular poison, you see on-screen the table, balls and a status line at the bottom. The screen is white with green bars representing the cushions, and the balls are black — thus avoiding attribute corruption problems; they also have their numbers on them. To make a shot you move a cross to some point along the desired line between cue ball and object ball, and hit the 'fire' key. The speed of the shot is controlled by a strength indicator. Unfortunately, the speed of the balls never gets much beyond sluggish ... they just bounce for longer. An added refinement is the kind and strength of spin.

If you haven't got a pool game then this isn't bad. *2/5* **MISS**

Dave The balls move accurately, but rather too slowly for my liking. The choice of games keeps it interesting for a while but it isn't good enough to knock CDS's *Pool* from the top of the Spectrum pool game league. *2/5* **MISS**

Roger It's impossible for me to be objective about this pool package because I find the original game as objectionable as any programmed simulation. Trying desperately to be fair, I can only say that it must be possible to create better visual representation and action than this offering. *0/5* **MISS**



EYE OF BAIN
Artic/£6.95

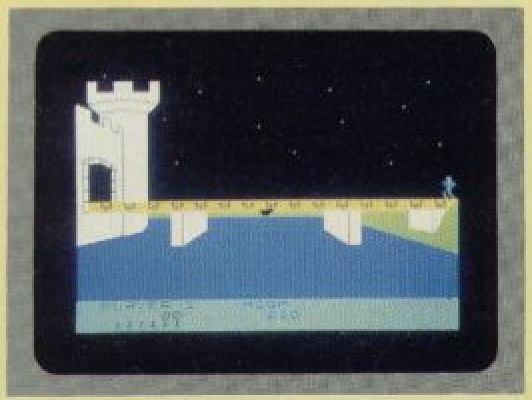
Ross The task set in Artic's *Eye of Bain* is to locate and hang on to a priceless emerald. You don't, however, start off in the easiest of circumstances. At first you seem to be in a hut, and typing 'Look' will instigate the drawing of a full screen picture of your surroundings. It's not until you start to try and move around that you're told a chain is clamped to your leg — which in turn is attached to a pole. To free yourself you have to type in two absolutely correct words. This problem of syntax and vocabulary is one that I find very annoying with adventures in general and *Eye of Bain* is no exception. For example, words that are used to describe objects at a location are not recognised if you try to use them yourself.

All the locations I visited had an associated picture and most had some useful objects, or tasks that needed to be performed. The top few lines of the screen are devoted to describing the location ... its exits and objects. This is quite useful but my more hardened adventuring friends suggested that it detracted from the atmosphere of the game.

A reasonable adventure, but I got stuck because I hadn't quite got the language right. *2/5* **MISS**

Dave It took me about ten minutes to get started and I'm nowhere near finished yet. The game is interesting enough for me to keep on trying. *3/5* **HIT**

Roger Tarl the mighty warrior turned out to be a bit of a wimp thanks to my erratic, misspelt or incomplete commandments. Adventurers should have patience with the lame lexicon, though, because I haven't declared the sacred emerald on my tax return yet . . . *3/5* **HIT**



DRAGONFIRE
Cheetahsoft/£7.95

Roger Prefaced with barking hokum about militant rebels and their house-trained dragons depriving young Prince William of his treasure, this program is enough to put even you off royalty for life.

Our regal hero begins his attempt at regaining his birthright on the first screen depicting the castle gates and drawbridge. All the young lad has to do is nip across quick, dodging the odd gob of lethal dragon fire, to gain entry to the treasure.

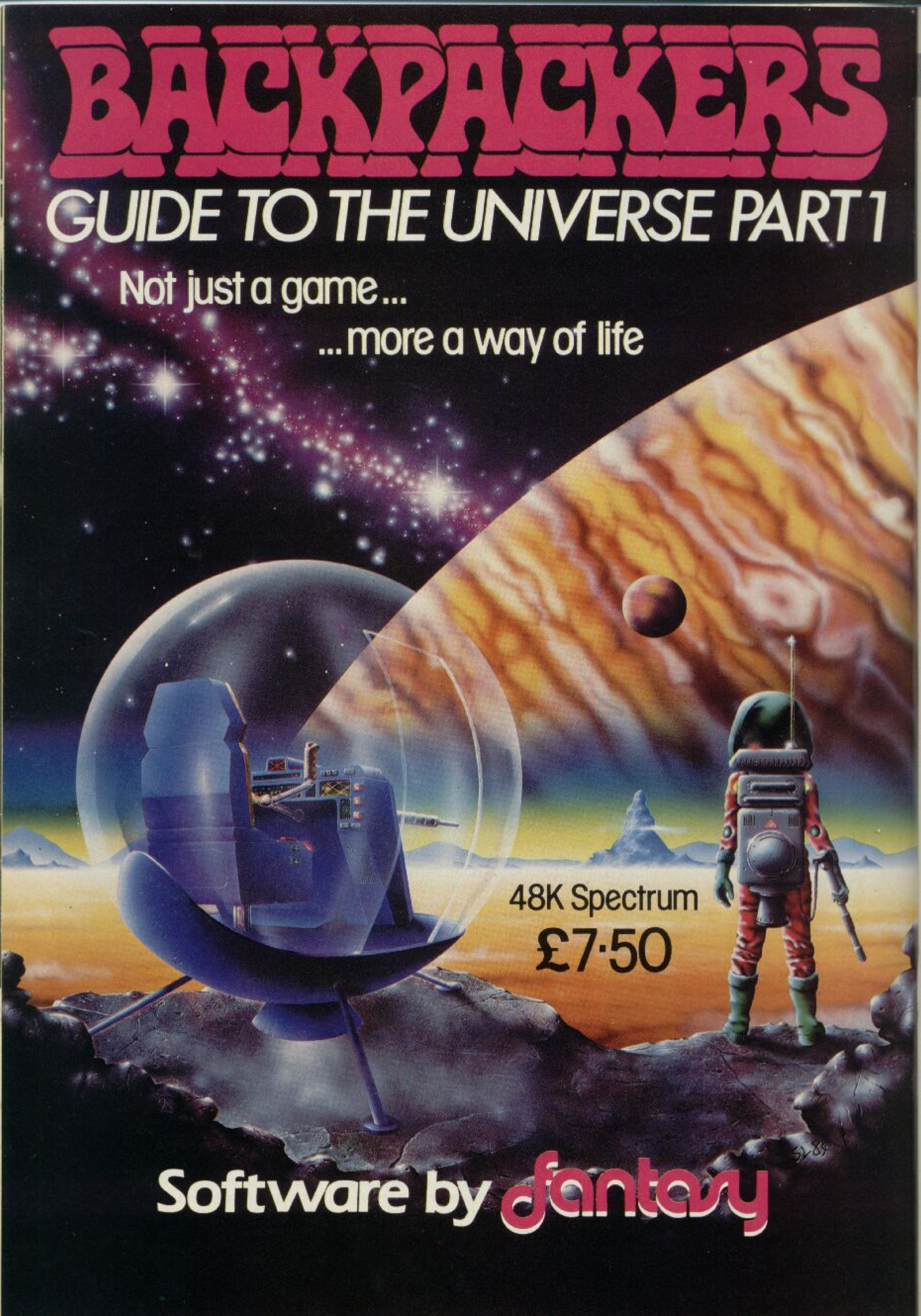
So far, so good, and on to the second screen, which has even cruder graphics. The noble prince can be shuffled round safely out of dragon-range and the relevant goodies scooped up into His Highness's Post Office account — or wherever yer Royals keep their negotiables. Prince and player should then be trembling at the dire warning about how hard life gets after the second level ...

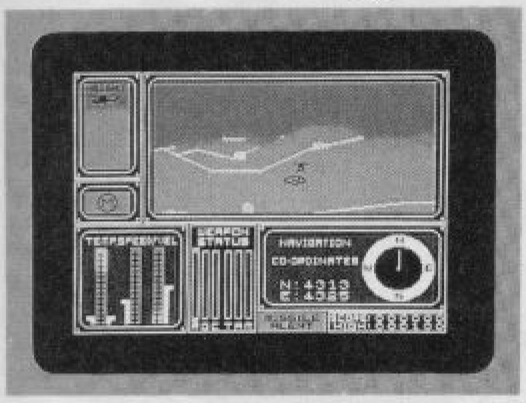
Although there's a voluntary choice of four difficulty levels, the game automatically gets more serious with success — but the grandiose let-down is that there *isn't* anything past the second level. That's your lot, mate! It's back to the first screen ... it just gets harder.

What we're actually looking at is a stunning lack of program content and detail. Boredom grows faster than skill rating and, quite frankly, *Dragonfire* has got about as much future as the feudal system. *1/5* **MISS**

Ross How they ever managed to write this code in such a way that you need 48K to run it, I'll never know. This is one that wouldn't have been well received two years ago! *0/5* **MISS**

Dave A real contender for the Turkey of the Year Award is this one, the graphics are awful (the jumps are particularly hilarious) and the game has no real challenge to it. *0/5* **MISS**


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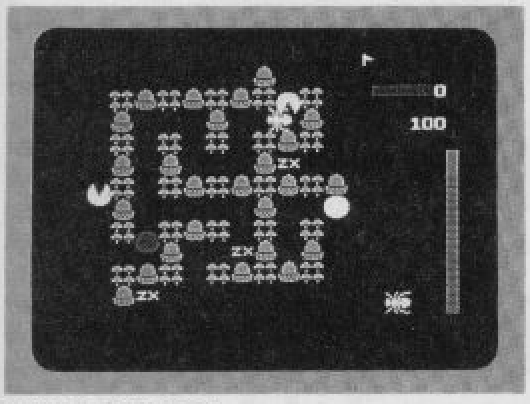
Dave *Combat Lynx* is a battle simulation program that has you flying your Lynx helicopter around a three-dimensional battlefield (which is randomly created for each game); you have to perform the dual function of destroying enemy forces and supplying your bases.

Controlling your helicopter can be a bit of a nightmare, because there are four command modes and some keys are used in more than one mode to perform different functions. Even allowing for this, there are nearly 30 control keys (most are re-definable) although any keyboard reading joystick can be used for five of them.

The screen shows your flight instruments and a rather peculiar view of your helicopter. It's strange because, although you can fly in any direction, the view of the landscape is always North, South, East or West, with the helicopter graphic turning through up to 45 degrees. When you turn far enough, the screen blacks out and re-draws with the landscape turned through 90 degrees. These factors neatly conspire to turn what is basically a very good game into a mess. *2/5* **MISS**

Ross The representation of the hills and valleys is well performed and fast. *2/5* **MISS**

Roger Sorry Colonel, but it ain't *simulator* material for hackers with Falklands Factor aspirations and it ain't *simple* enough for all us conscientious objectors still hiding in arcades. *2/5* **MISS**



HYPERACTION
Silversoft/£5.95

Ross Silversoft's more recent output has tended to be colourful, well writen and fun to play — and Hyperaction is no exception. At first glance it seems a sort of cross between *Pacman* and *Pengo*, but it's actually different again. To begin with, each screen cleared means another almost totally different game, strategy-wise.

In screen one you're a spider in a maze consisting of blocks of greenery separated by patches of mushrooms. Also tucked up inside the maze are four 'ZX' symbols and the object is to collect all of them and return pronto to the centre of the maze. The only problem is that Pacmen also live in said maze and if they touch you — whoops, there goes another life. You can push around the blocks of greenery to alter the maze and block in the Pacmen — but watch out!

The next game has you trying to destroy all the blue maze pathways by walking over them. The following screens are variations that get increasingly more difficult. I couldn't get past screen five, where marauding 6502 chips soon polished me off.

Good graphics and a fun game. Careful thought is needed if you're going to be good at it. *4/5* **HIT**

Dave A nice *Pengo* variation with good graphics. Possible a bit too fast but very addictive. *3/5* **HIT**

Roger I'd like to say it only had one screen, but that'd just be an excuse for my bad play! Pure arcadia in the best sense of the word. *3/5* **HIT**



KENTILLA
Micromega/£6.95

Dave *Kentilla* is a text and graphics adventure by Derek Brewster, and a follow-up to his very successful *Velnor's Lair*. The story follows on from the previous adventure with 'baddie' Grako taking over from Velnor; he's hungry for the Moonstone of Algrath — the source of Velnor's power. Mr Brewster writes an adventure column for a certain Spectrum games review magazine, where he gives each adventure a rating under five different headings. It seems fair, therefore, to rate his own adventure in the same way.

Atmosphere: The graphics are good but, as Derek has himself said, most graphics are no substitute for good text; his are no exception.

Vocabulary: Kentilla has a very good input editor which behaves rather like the Basic line editor.

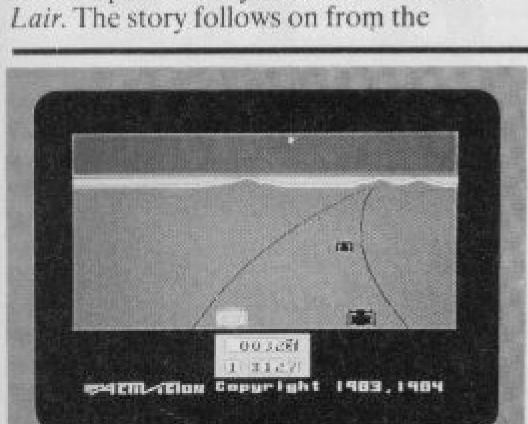
Logic: After some three hours of play I was still stuck within a 10-location section, while trying everything I could think of to progress. I must have missed something but either it's too obvious to notice (if so, then apologise to Mr Brewster) or it's completely illogical.

Debugging: Very good.

Overall: I'd have expected something better from someone who tells people what's wrong with *their* adventures. *2/5* **MISS**

Ross A reasonable enough adventure with good edit and recall facilities. I didn't like the way it lists out objects, exits and so on, and the puzzles were a bit too puzzling for me. *2/5* **MISS**

Roger Is our hero's surname meant to be Livingstone or do we need to move further North and interpret this as a mystical allegory on a quiet day at the National Union of Miners? Did Grako cross picket lines when he returned to the abyss? Am I mad? *4/5* **HIT**



ENDURO
Activision/£7.99

Roger Although we're talking racing cars here rather than motorbikes, the scenario and practical action of *Enduro* is very similar to Micromega's *Full Throttle*. The player uses a pair of keys to steer, and has both throttle and brakes on the keyboard. Joystick control is easier and obviously more instinctive, with a simple pull-back on the stick to hang out the anchors.

The challenge is to keep on going in any weather or visibility condition, overtaking the requisite number of other cars each 'day'. During the first cycle, 200 cars must be passed and in subsequent 'days', the opposition increases to 300. Apart from 'day' and 'night' driving conditions — only tail lights are visible during the latter — ice and fog also appear, demanding slower, more careful and precise car control.

The essential similarities to *Full Throttle* are tracking control and graphics, in as much as the visuals are dominated by a wiggling ribbon representing the road, tapering off to the horizon. I suppose it's got the same ability to excite, amuse and addict 'go-faster' merchants, but it ain't sufficiently different to justify acquisition if that other program's been LOADed in the recent past ...

To be honest, I got quickly tired of it, but there again, I've been tired all my life ... *3/5* **HIT**

Ross Very similar to the VCS version. An outdated game more like a dodging blobs session. *1/5* **MISS**

Dave The graphics are quite good. The cars coming towards you are not exactly perfect but they're reasonable and they move fast. It seems quite easy to master and will probably get tedious once you get the hang of it. *3/5* **HIT**

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TROUBLE BREWIN'

Silversoft/£5.95

Roger Never mind *Trouble Brewin'*, I had trouble playing this game! Typically, most of the aggro came from a complete lack of instructions or explanations with the test sample, which meant that I had to suss out the required action on each of five screens. Fortunately, a 'practice' facility accesses any of the screens and erratic key-stroking soon indentified the point of it all.

Imagery is mostly concerned with alcoholic beverages, a subject extremely dear to my heart. Barrels, vats and glasses of bubbly proliferate. In the first screen, a deadly corkscrew is just one of the things to be avoided and in the fifth, the champagne realistically knocks you out — well, it always makes me comatose!

Altogether, despite my 'orrible suspicion of things arcade, I must say that the game did seem a bit — dare I say — easy. The mobile nasties and fixed obstacles are far too predictable and crude.

Maybe it'll be a big success with 'Real Ale' freaks, but I think I'll stick to lager. 2/5 **MISS**

Ross Silversoft has come up with more pretty graphics. It also seems to have the knack of making the nasties just intelligent enough to cause problems, but not so you can't escape. 3/5 **HIT**

Dave Just the job if you're looking for another 'jumping around and collecting' game. It has nicer graphics than most but calls for arcade skill rather than planning. 3/5 **HIT**



ZENJI

Activision/£7.99

Dave *Zenji* is the latest in a long line of computerised puzzles and it comes complete with the obligatory mish-mash of philosophical bits and pieces that are traditionally used to jazz up this type of program.

In order to achieve 'Zenji' you must rotate the maze 'elements' (straight lines, corner pieces and 'T' shapes) so that they all join up with a particular element known as the 'source'. Rotation is achieved by moving your face-shaped player to the centre of the element you wish to turn and pressing a special key (or the joystick button) along with a rotation key. In normal use the rotation keys move you left and right, with two more keys for up and down. There's a time limit for the completion of each maze (which get bigger as the game progresses) and 'Flames of Desire' appear which follow you around and quite rightly provoke fatal consequences if touched.

Zenji will appeal mostly to puzzle enthusiasts but on the higher levels it becomes quite a test of arcade skill. As the cassette sleeve says, you have to 'let go' and leave your fingers to do the work on their own. 3/5 **MISS**

Ross Quite an intriguing little mind-twister with reasonable graphics and easy-to understand instructions. However, that's not saying it's easy to play. If you like 'thinking' games, then this could be worth a look. 2/5 **MISS**

Roger The 'Flames Of Desire' are not a threat I learnt to fancy much but that's not because I suffer 'illusions' . . . Lust for success and puzzling enlightenment failed to overcome my lack of skill, Oh Grey One . . . 4/5 **HIT**



BEACH-HEAD

US Gold-Ocean/£7.95

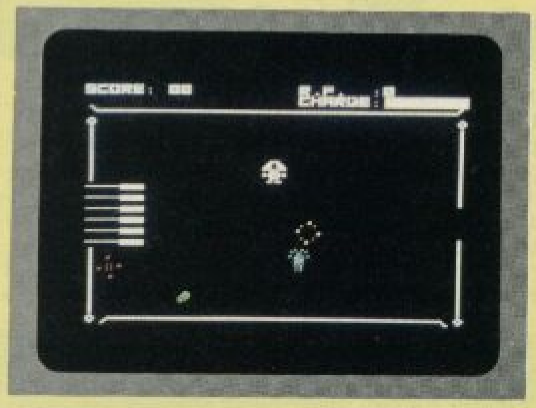
Ross One of the Commodore 64 gamester's most popular releases, *Beach-Head* has now been implemented on the 48K Spectrum — courtesy of the combined might of US Gold and Ocean. Personally, I never found it that brilliant on the 64, but certainly it's easily as good on the Speccy.

Beach-Head is a multi-screened (six in all) arcade/war game where the aim is to penetrate the defensive power protecting a piece of coastline, and capture the enemy fortress. The first screen is a plan view of the coast you're going to attack; you move a cross (representing your fleet) through a secret passage and into combat with the opposing forces. The other five screens are rather more lively. They involve steering your ships through a barrage of torpedoes, shooting down attacking planes, sinking the enemy ships, guiding your tanks through the shore defences and finally blowing up the enemy's Big Gun.

This is definitely the best piece of code ever written by Ocean. It has good instructions, comprehensive player and control options and a good range of skill levels. 3/5 **HIT**

Dave Ocean has done well in converting this from the Commodore 64 version. The game is very playable and the graphics are good, especially the plane attack phase. Even so, it hasn't got very much lasting appeal. 3/5 **HIT**

Roger Not enough authentic strategy to please commited wargames recruits and not enough zap-splat-kapoww! to satisfy the electronic bloodlust of trigger-happy arcade troopers. Nevertheless it's got sufficient entertainment and complexity value. 2/5 **HIT**



PSYTRAXX

The Edge/£7.95

Roger A sample tape with hardly any instructions didn't increase the likelihood of my establishing instant rapport with this game. I'm still not completely sure what you're supposed to achieve and/or whether there are hidden programming secrets that incompetence and general lack of Willis-interest failed to unlock.

If my eyes haven't decieved me — which is always possible — the on-screen action occurs on a circuit board and involves the usual four-key control of movement plus the ability to zap any oppostion with what one can only assume are graphic attempts to represent electro-magnetic energy.

I would call it a one-screen stand even though it's claimed to have over 1000! It's not that other screens didn't exist, they're just not that different. The graphics are abysmal — unclear and unoriginal. The screens seemed to suggest the programmer had defined a few characters at the most, and then used them around the edge.

If your vocabulary in Basic is even smaller than your basic vocabulary, then it might just hold your interest for longer than it did mine, but I doubt it. I'm afraid I have to report that this is one of the most boring and overrated games I've had the misfortune to play since an old schoolfriend brought out his conkers! 1/5 **MISS**

Ross A competent piece of software but rather dull in play and certainly not original. If you like mapping games, look no further. 3/5 **MISS**

Dave Very like *Atic Atac* in approach but with less interesting graphics. The Edge is claiming a new programming technique called *Synergy* allowing it to get over 1000 screens in 48K; *Similar* would probably be a better name 'cos that's what the rooms are. 2/5 **MISS**

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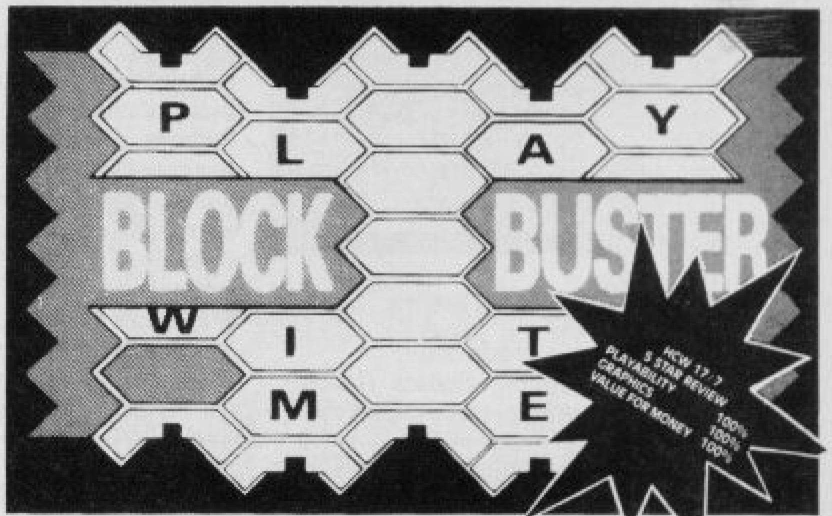
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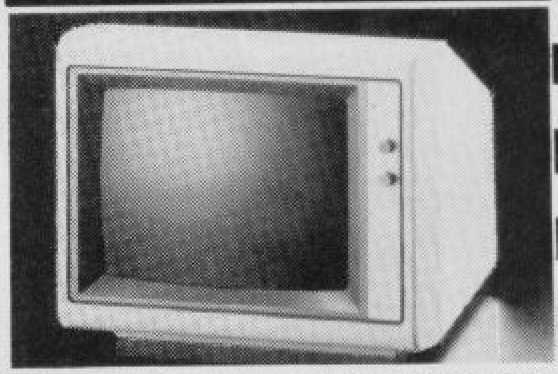
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EUREKA
£25K IN 48K

This month, I bring you details of Domark's first game — *Eureka*. Yes, this is the one that has the £25,000 prize tagged on to its rear-end (check out the ads this month). The game wasn't supposed to be available until the 31st October — magazine editors being no exception. On the other hand, we here at *YS* always get those exclusive stories!

The game splits into five separate parts, each made up of an arcade game and an adventure. The former gets a pretty low rating in my book and probably wouldn't interest you adventure fanatics anyway. So no more about it, save the excruciating fact that you *have* to complete the arcade game before you can play each adventure. Yah boo sucks!

The aim of the fivesome is to present a potted history of our meagre planet — starting in Prehistoric times, working on through the Roman Empire, Medieval Britain, Germany during the second World War, and on into the future. Most of the locations you visit contain graphics and, although they use a slightly lower resolution than the ZX Spectrum allows for, they're very cleverly used. At only £14.95 this set's well worth an investment. Here are a few clues to help with the 'War' level.

The action begins in a cornfield (no, not *that* sort of action!) and from here you'll need to go south-east to find the RAF officer's uniform. When you get caught by the Germans in the village (which is inevitable) you get hauled off to Colditz and stuck in the cooler. Once out, finding your way around the camp isn't too difficult and there are only a few locations where the guards get nasty and throw you back in again.

To make a German officer's uniform you'll need the sewing kit, and that you'll find under the stage. To get an ID card you'll have to go through the secret passage in the chapel — there you'll find the blank card, plus rubber stamp and camera. To make the ID look genuine, you'll need to take a picture of yourself, develop the film, stamp the card — and then bring the pieces together with the MAKE command.

The rope, made from the traditional blankets, can be used to scale the drop below the window at the end of the dormitory, underneath which you'll find a pickaxe and crowbar.

Once out of Colditz, you'll find yourself in the village, but so far further progress has been very slow. However, I'm sure there'll be plenty of hints on all five games in the future ... watch this space! YS

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VENTURING OUT

HAMPSTEAD
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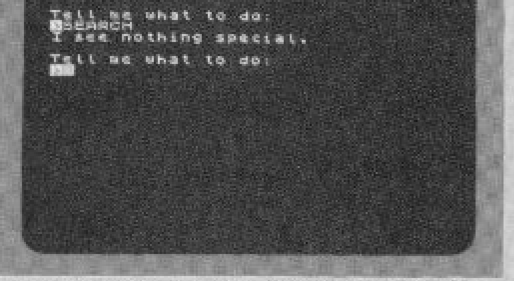
If you've extricated yourself from the magical grasp of Dieslowly the Wizard and beaten Bashenchopen the Troll black and blue and you're still driving around in a clapped-out Mark 1 Cortina and drinking pints of best down at the local, then *Hampstead* is the game for you.

You start off in your disgusting flat in north-west London watching '1-2-3' on TV (presumably you couldn't get any lower than that!). Having decided that life surely has more to offer, you begin to progress up the social scale — until you have satisfied all the requirements necessary to attain 'Hampstead'. The idea is that you'll be able to pass into said borough and be accepted by the other inmates. Requirements, of course, include such material possessions as a big car and house ... and you also need a good job, a nice wife (sexist devils!), and naturally you have to be seen in the right places wearing the right clothes.

The adventure comes in the now almost mandatory large plastic box that includes a 16-page booklet containing much of the background information that's necessary for social climbing.

Most of the puzzles are thoroughly logical (there's no using a toilet roll to open the large stone portcullis here!), and the few that aren't will be explained somewhere; exploring is very worthwhile. In fact, the problems are nicely graduated and the further you get, the harder it becomes to progress; the puzzles are also quite linear and each section has to be solved before social aspiration can begin anew for the next. (For instance, you'll get nowhere without your dole money!).

All in all, *Hampstead* is an excellent adventure and a refreshing change from the usual dungeons-type affair ... it makes a worthy addition to any collection.



You'll have to progress from shandies to champers in Melbourne House's social climbing *Hampstead*.

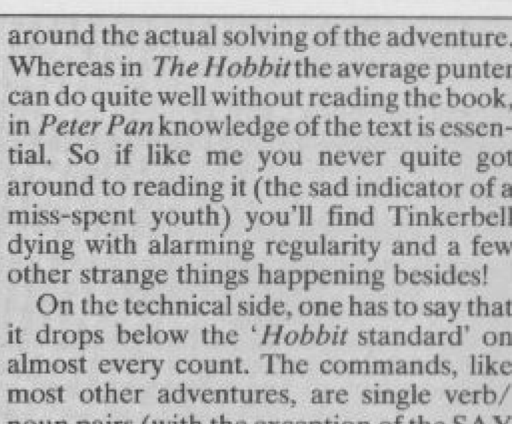
PETER PAN
HODDER AND STOUGHTON/£9.95

Peter Pan is the first adventure — in fact the first game of any kind — from book publishers Hodder and Stoughton. The package includes a large plastic video box containing the cassette, a copy of the original book and a four-page introductory leaflet which explains the aims of the game and some of the more useful commands. Out of the retail price, a contribution is made to the Great Ormond Street Children's Hospital as part of the 'Barrie Bequest' — a worthy cause indeed.

Peter Pan's format owes a lot to *The Hobbit*, with full screen graphics and independent characters. There are, however, several differences — many purely technical but one in particular that centres around the actual solving of the adventure. Whereas in *The Hobbit* the average punter can do quite well without reading the book, in *Peter Pan* knowledge of the text is essential. So if like me you never quite got around to reading it (the sad indicator of a miss-spent youth) you'll find Tinkerbell dying with alarming regularity and a few other strange things happening besides!

On the technical side, one has to say that it drops below the '*Hobbit* standard' on almost every count. The commands, like most other adventures, are single verb/noun pairs (with the exception of the SAY command which allows you to speak), and the input routine is slow — as is the response to commands. But *PP* does manage to serve up some very good graphics.

Actually, despite all the forgoing, I think *Peter Pan* really is a reasonable adventure ... it's just that it suffers from an overdose of bad programming. I wouldn't recommend it to everyone, but if you've read the book — or if you're one of those avid adventurers — you'll probably find it quite enjoyable. YS



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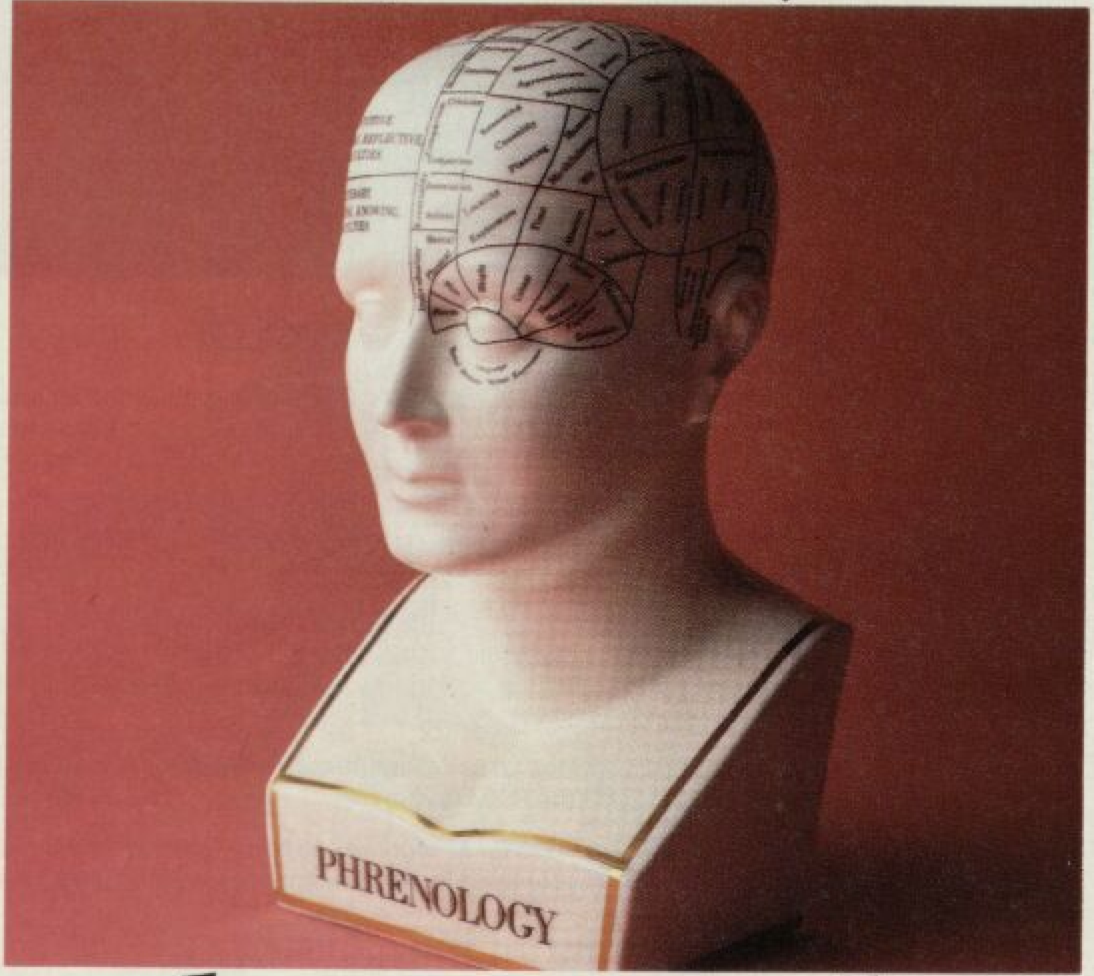
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AWESOME SECRETS OF THE QL

Those of you with your own QL who have started to explore its many mysteries and delights will probably be tired of the constant barrage of bitching and criticism. What you want to see are the micro miracles other computers fail to offer. Quentin Lowe reveals one of the QL's lesser-known qualities.

Ingredients required: your QL and a copy of *QL Archive.* You'll be glad to hear that the following experiments won't affect anything that's on the cartridge. OK, put your QL into SuperBasic and when MDV1_ has stopped spinning, place your *Archive* tape in the drive. Now, load up the short Basic program used to load *Archive.* Type:

```
LOAD MDV1_BOOT
```

Notice how long it takes to load. Use LIST and you should see the program. Now, get rid of the program by typing:

```
NEW
```

Type LIST to prove the program has gone... there's no trickery here! Now, let's load it again:

```
LOAD MDV1_BOOT
```

Well, didn't that load quickly! The QL can't have looked at the cartridge for more than a quarter of a second. Don't believe it? Type LIST and you'll see that the program is back.

THEORY AND FACT

Let's be scientific about this and presume that the Microdrive tape was in exactly the right place to get the program. If it was, it should be just past that program now. Assuming the tape can't go backwards (a fair assumption I think) and even if it could, the QL wouldn't know it needed to go backwards (definitely a fair assumption), then it follows that if we try to load the program again, the QL must have to go all the way round the tape to get it. So, type:

```
NEW
```

Followed by:

```
LOAD MDV1_BOOT
```

And it did it again, didn't it? So what's going on? Despite the fact that we have NEWed the program, the QL knows it has a copy of it in RAM. All it does is check that we haven't changed cartridges (with that quick quarter-second peep at the tape) and, if we haven't, it restores the program not from tape but from RAM.

You can probably see a couple of potential problems with this. Suppose we change cartridges for an identically named cartridge with a different program also called BOOT on it. This takes a bit of setting up but you'll find that it doesn't fool the QL. When you format a cartridge, the machine writes a random number to the tape along with the name. The quarter-second peep at the tape will tell the QL you've swapped cartridges and it'll actually load BOOT from the tape.

CHANGE THE TUNE

More obviously, suppose we change the copy of BOOT that's in memory and then NEW it. When we try to load the program again, if the QL uses the version that was just NEWed, we'll get the changed copy of the program back and not the original that we've asked it to load.

So, LOAD MDV1_BOOT if you haven't got it in memory at the moment. Then add lines:

```
5 REMark Here's a new line
6 REMark Here's another
7 REMark These shouldn't be here when
8 REMark we load the program
```

Now (roll of drums), NEW the program. And, type:

```
LOAD MDV1_BOOT
```

The QL peeps at the tape for a quarter of a second and then loads the program from RAM. Has it fouled-up and restored the changed version of the program? Actually, it hasn't. If you type LIST, you'll see that it's loaded a perfect copy of the original program without having to get it off the tape again.

This is nothing short of clever! Unless I'm mistaken (and Sinclair Research is welcome to say so) the QL is using a 'cache' memory for the Microdrives. When you read some sectors off tape, they're stored in this temporary cache and then copied to wherever they are needed.

SECRET CACHE

Next time you read the 'drives the QL has a quick peep to see if you've changed the tape. If you haven't, the contents of the cache memory are still current. If the sectors you want are in there, the QL turns off the Microdrives and copies the information from RAM instead. NEW really does scrap the program, but there's a copy of it in the cache and thus the QL can load it again very quickly.

Okay, so the QL's got a cache memory. There's nothing dramatic about that as with a little bit of hassle you can get one fitted to many business micros. You can even find the odd one with a cache as standard. However, I did promise something out of the ordinary. Normally cache memories are quite small and in a 128K QL (sorry, 96K... 32K is screen RAM), you wouldn't expect the cache to be very big.

SIZING IT UP

To test the size let's see if we can overflow it by reading a lot of information off the Microdrives. In this case, the cache should overflow and only be able to retain copies of the last few sectors read. Then if we ask for the information again, the QL will have to re-read the tape. So, suppose we copy the contents of the Archive demonstration database to the screen. Type:

```
COPY MDV1_GAZET_DBF TO SCR_
```

You'll see the database file in all its naked glory appear character by character on the screen. Keep an eye on MDV1_. Notice that the QL is reading a few sectors every few seconds. It takes a while. When it's finished, repeat the command:

```
COPY MDV1_GAZET_DBF TO SCR_
```

Amazing isn't it? The QL checks that you haven't switched tapes and then gaily trots out the whole database file from the cache memory without looking at the tape again!

So just how big is the cache? This little example seems to suggest that, unlike any ordinary computer, QDOS (the program producing these miracles) uses the free memory it has available to form a cache for the Microdrives.

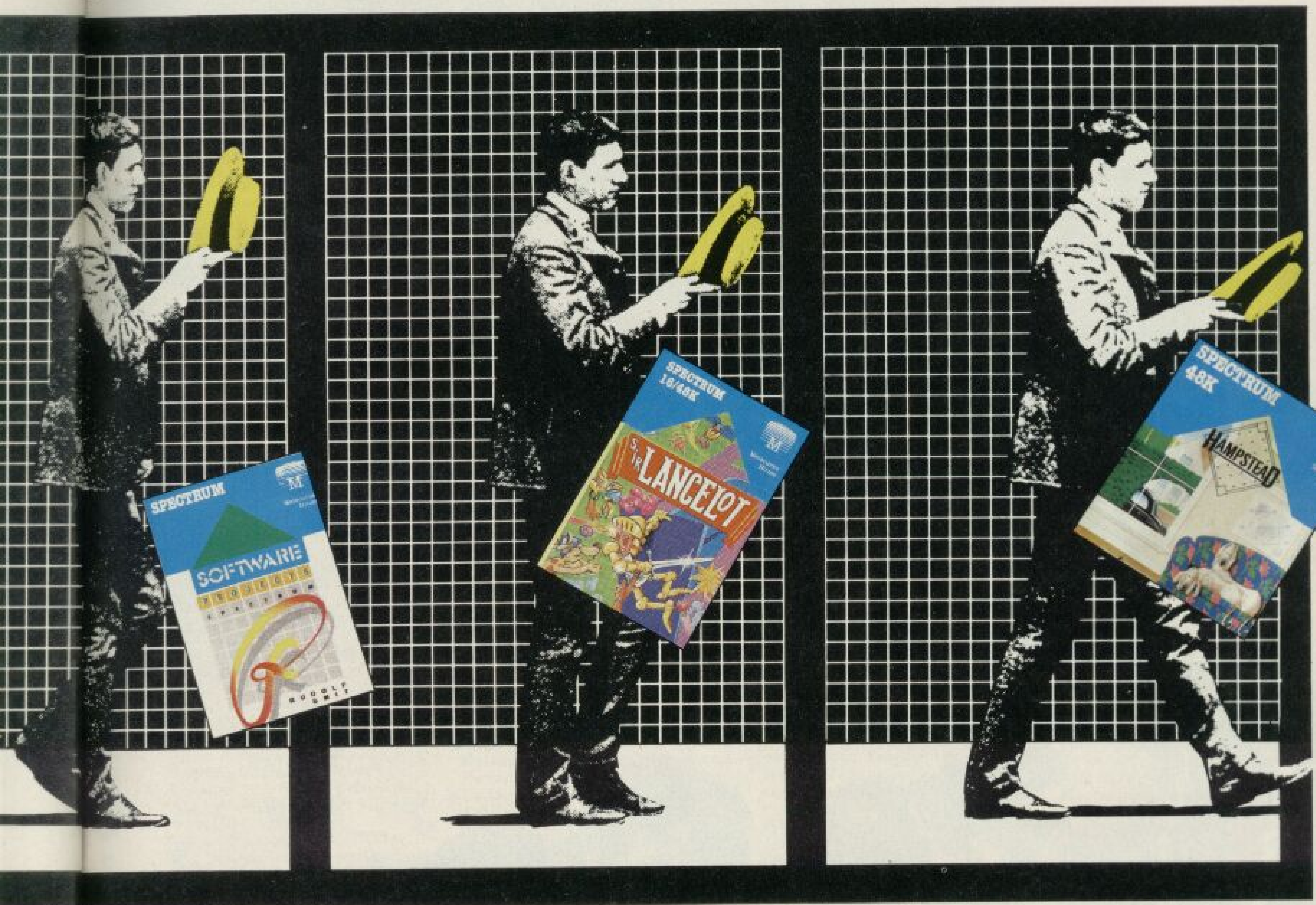
JOKING APART

There must be a lot more things going on to make such a system practical... if you come up with any further comments let us know. But the practical results of this big cache are obvious... it's going to be a lot quicker reading stuff off Microdrives than anybody previously suspected. Next time anyone tells you the QL has a noddy architecture or that QDOS is a joke, sit 'em in front of your machine and hand them this article! YS

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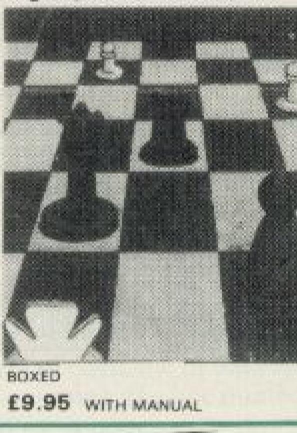
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■ For sale 48K Spectrum, Interface 1, Microdrive, two cartridges, ZX Printer, RS232 lead, programmable joystick interface, joystick, tape recorder, software worth £90, books. 4 Edge End Dobcross, Oldham OL3 5QJ. Ring Saddleworth 6329. Price £376 ono.

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■ 48K Spectrum, 200 games, utilities, etc, DK Lightpen, various books, three-channel Micro Power sound board. Offers? Phone Paul on 0326 317998 evenings.

WANTED

■ Any joystick wanted (Kempston if possible). Must work. Will swop or pay for. Phone Daniel Davies, evenings only 01-286 8918.

■ Secondhand 48K Spectrum. Must work. Phone Guildford 503876 or write to 9 The Crossways, Onslow Village, Guildford, Surrey GU25 5QQ.

■ Wanted. Alphacom 32 printer. Swop Tape R/C and £30; plus £20 software. Preferably Manchester area or Lancashire people with names like 'Sir Clive' given preference. Phone 061-205 5263 anytime.

■ Wanted *YS* 2 and 3. I offer *Tranzam, Spectre, Styx* and *3D Combat Zone* (original tapes and labels, not copies). Send address and/or phone number to J P Chartier, 11 Rue Ronsard, 28630 Barjouville, France.

■ ZX80 4K ROM in very good condition. Boxed, manuals, etc. Will pay £10 approx. P Rose, 22 Grange Gardens, Wellesbourne, Warwick CU35 9RL. Also interested in any other defunct computer in good condition.

■ Interface 1 and Microdrive. Swop for 10 games and Currah MicroSpeech. Contact Norman Tierney, 5 Campian House, Mayville Estate, Matthias Road, London N16. I need it urgently.

■ Wanted 48K Spectrum, keyboard, Alphacom or other printer, recorder. All or any combination considered. Contact Rik Bennett, 8 Elm Close, Tarporley, Cheshire. Or phone 08293 3369 (will collect).

■ Interface 1 plus Microdrive. Will swop £90 of software. *Psytron. Trashman, Hunter Killer, ELT.* M Mayhem, 23 Whitby Grove, Swindon, Wilts. Telephone Swindon 612594.

■ Issues 2 and 3 *Your Spectrum*, will pay £1 each plus postage and packing. Andy Sheppard, 32 Gorse Street, Stretford, Manchester M32 0HZ.

■ Issues 1 and 2 of *Your Spectrum* (must be in good condition). Will be willing to pay up to £1.50 each. Stuart Knight, 7 Furlong Road, Westcott Dorking, Surrey RH4 3PP.

■ Name price of copies 2 and/or 3 of *Your Spectrum*, without bits cut out please! Send your bids to Mark Keneally, Skehacrine, Abbeyside, Dungarven, County Waterford, Eire.

■ *YS* issues 2 and 3. Exchange or purchase (issues 6/7). Contact Martin Reid, 2 Empress Way, Euxton, Chorley, Lancs PR7 6QB.

■ Vol 1/2 (Feb/Mar) and vol 1/3 (Apr/May) of *Your Spectrum*. Phone Northampton 717502 and ask for Duncan.

MESSAGES

■ Speccy register for 48K Speccy owners with young children. Send for further details including your child's name and age (1-7 years). 38 Homedale House, 3 Brunswick Road, Sutton, Surrey SM1 4DG.

■ Can you help me? I am looking for a computer club for the Spectrum in Burnley or Rossendale. Phone Rossendale 227840 between 4pm and 6pm midweek and ask for Paul.

■ Can anybody help me with Hewson Consultant's *Quest Adventure*? Please write to Jonathon Bell, 2 Buller Park, Porton, Nr Salisbury, Wilts.

■ Request info from users of *The Quill* on methods of random monsters and use of flags. Also opinions on *Sprint*. Is it worth the money? M A Riddell, 87 Ivanhoe Drive, Glenrothes, Fife KY6 2NF.

■ Prestel users mailbox me for a chat, especially local users interested in using their user to user software. Free program to anyone who does. Keith Burton. Mailbox number 226292118.

PEN PALS

■ Accomplished hacker would like to contact any hacker, experienced or beginner, by letter or tape for exchange of ideas and conversation. Write to Kevin Metcalfe, 27 Fletton Avenue, Peterborough PE2 8AX.

■ I've just started *Sherlock* and *Fantasia Diamond* and would like a penpal to play either/both with. Tony Slater, Flat 3, 87 Dunsmore Road, London N16 5PT.

■ Pen pal wanted. Phone Kemish on 01-861 0340 after 4pm.

■ I'm Ricky and I am 14. Other than computers, I like videos. I would like a pen pal of the same age. Phone 041-773 2707.

■ I want a pen pal about 13 years old and interested in adventures, swopping programs and tips and messing up WH Smith's computers! Phone Dave on 021-449 3673 after 5pm.

■ I have loads of software to swop. Also have a VTX and user to user software. Keen hacker or games freak preferred. Philip Crawley, 3 Hilton Close, Stirchley Park, Telford, Shropshire TF3 1RG.

■ My name is Keir. I like all indoor sports and Michael Jackson. My age is 12. I would like a pen pal of same age. Phone 061-860 7938.

■ I would like a 10-year old girl pen pal to share Speccy games and tips. Please write to Helen Fircroft, Gladsmuir Road, Barnet, Herts or phone 01-449 5815.

CLUBS & EVENTS

■ Microelectronics Applications Fair is in its third year of running and exhibitors are again expected to be covering the whole software/hardware spectrum. As usual it will be held at Barden High School, Burnley, Lancs on Saturday, November 10th, from 10am-4pm.

■ Software exchange club. National organisation with huge program base seeks new members (Spectrum and Dragon). SAE please for membership forms, etc. UK Sec (YS), 15 Tunwell Greave, Sheffield S5 9GB. YS

PROGRAM POWER

A bumper Xmas collection of four fantastic programs for you to tap into your Spectrum, courtesy of* Martin Evans, Gavin Monk, Tony Samuels *and* Robert Stockton. *If you've written a program that's good enough for publication, send it to Gavin Monk, Program Power, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

MESSAGE MOVER

BY MARTIN EVANS

Have you ever wanted to put a message or instructions for a game as scrolling text on the 23rd line of the screen display — just like they do in the professional commercial packages? Well, here's your chance. This machine code program can be used to display a string of text which is constantly scrolled so that the words go off one side of the screen as others enter from the opposite side.

I've produced an assembly listing of the routine (listed from the *GENS3* HiSoft assembler), but there's also a Basic program which will do the trick if you've not got an assembler at hand. The Basic listing of the routine should be typed in directly as it stands; you'll notice that a number is included at the end of each line of data as a checksum and, if a mistake is made in your typing, the line number containing the mistake will be displayed on-screen.

Once you've typed the program in without error, it would be wise to save it using SAVE "SCROLL" CODE 60000,95. It might also be a good idea to save the Basic as well, so that you can make the suggested changes that follow without corrupting your copy.

The Basic can now be erased using the command NEW — the machine code will, of course, still be present as it's positioned above RAMTOP. To test the routine, type in the second Basic program given and RUN it — you should now get the contents of zS scrolling, pixel by pixel, across the 23rd line of the screen display. To return to Basic, simply press any key.

To incorporate this routine in one of your own programs, you should use the second program given as a subroutine, define your particular message as zS and then GO SUB to the subroutine. The machine code is completely re-locatable, but it must *not* be loaded to the same address as the data for the message — otherwise you'll crash the computer.

As the routine stands the string will be scrolled round and round until a key is pressed. However, to alter the routine so that the message is only scrolled once, the value '40' in line 70 of the first program must be changed to '200'; alternatively, you could load the machine code, type POKE 60065,200 and re-SAVE the code as shown above.

16K Spectrum owners will be pleased to hear that they're not left out — for once! Simply add these two lines to the second Basic program:

```
15 RANDOMIZE (NEW ADDRESS)
16 POKE 60001, PEEK 23670: POKE 60002, PEEK 23671
```

You'll also have to alter the value '59399' in lines 30 and 50 to a new value 'new address — 1'.

As a last note, when POKEing zS into memory, it's important that the last address is POKEd with zero to tell the routine where the end of the message is; look at line 50 of the second Basic program.

```
EA60            0020        ORG   60000
EA60 2107E8     0030 LOOP4  LD    HL,59399
EA63 22005B     0040        LD    (23296),HL
EA66 1828       0050 BEGIN  JR    PRINT
EA68 3E08       0060 RETUR  LD    A,8
EA6A F5         0070 START  PUSH  AF
EA6B 0608       0080        LD    B,8
EA6D C5         0090 LOOP5  PUSH  BC
EA6E 06FF       0100        LD    B,255
EA70 10FE       0110 LOOP3  DJNZ  LOOP3
EA72 C1         0120        POP   BC
EA73 10F8       0130        DJNZ  LOOP5
EA75 21FF58     0140        LD    HL,22783
EA78 E5         0150        PUSH  HL
EA79 0E08       0160        LD    C,8
EA7B 0620       0170 LINE   LD    B,32
EA7D E1         0180        POP   HL
EA7E 25         0190        DEC   H
EA7F E5         0200        PUSH  HL
EA80 B7         0210        OR    A
EA81 CB16       0220 BYTE   RL    (HL)
EA83 2B         0230        DEC   HL
EA84 10FB       0240        DJNZ  BYTE
EA86 0D         0250        DEC   C
EA87 20F2       0260        JR    NZ,LINE
EA89 E1         0270        POP   HL
EA8A F1         0280        POP   AF
EA8B 3D         0290        DEC   A
EA8C 20DC       0300        JR    NZ,START
EA8E 18D6       0310        JR    BEGIN
EA90 FF         0320 PRINT  RST   56
EA91 3A055C     0330        LD    A,(23557)
EA94 FE00       0340        CP    0
EA96 C0         0350        RET   NZ
EA97 2A005B     0360        LD    HL,(23296)
EA9A 23         0370        INC   HL
EA9B 22005B     0380        LD    (23296),HL
EA9E 7E         0390        LD    A,(HL)
EA9F FE00       0400        CP    0
EAA1 28BD       0410        JR    Z,LOOP4
EAA3 21003C     0420        LD    HL,15360
EAA6 010800     0430        LD    BC,8
EAA9 09         0440 LOOP1  ADD   HL,BC
EAAA 3D         0450        DEC   A
EAAB 20FC       0460        JR    NZ,LOOP1
EAAD 11FF50     0470        LD    DE,20735
EAB0 EDA0       0480 LOOP2  LDI
EAB2 1B         0490        DEC   DE
EAB3 14         0500        INC   D
EAB4 79         0510        LD    A,C
EAB5 FE00       0520        CP    0
EAB7 20F7       0530        JR    NZ,LOOP2
EAB9 18AD       0540        JR    RETUR
                0550        END
```

This is an assembly listing of the scrolling routine given by the *GENS3* HiSoft assembler. If you've not got an assembler to hand, use the Basic loader given.

```
   1 REM Scrolling Bottom Line Message
   5 REM PROGRAM 1
  10 DATA 33,7,232,34,0,91,24,40,62,8,531
  20 DATA 245,6,6,197,6,255,16,254,193,16,119
4
  30 DATA 248,33,255,88,229,14,8,6,32,225,113
8
  40 DATA 37,229,183,203,22,43,16,251,13,32,1
029
  50 DATA 242,225,241,61,32,220,24,214,255,58
,1572
  60 DATA 5,92,254,0,192,42,0,91,35,34,745
  70 DATA 0,91,126,254,0,40,189,33,0,60,793
  80 DATA 1,8,0,9,61,32,252,17,255,60,715
```

```
  90 DATA 237,160,27,20,121,254,0,32,247,24,1
73,1295
```

Lines 10-90 Contain the data for the machine code routine. The last number on each line of data is the value of the checksum — so you'll know whether a mistake has been made as soon as you RUN the program

```
  95 CLEAR 59399
 100 LET b=0
 110 FOR n=60000 TO 60091
 120 READ z
 130 IF z>255 THEN  LET d=b: LET b=0: IF z<>d
THEN  PRINT "ERROR IN LINE ";(INT ((N-60000)
/10))*10
 140 IF n=60091 THEN  STOP
 150 IF z>255 THEN  GO TO 120
 160 POKE n,z
 170 LET b=b+z
 180 NEXT n
```

Lines 95-180 Lower RAMTOP, clear the checksum (b), and READ and POKE the data making sure the checksum is correct for each line.

This program allows you to enter the machine code scrolling routine in Basic. Once you've made sure it's error-free, SAVE it to tape using the instructions given in the text.

```
   5 REM PROGRAM 2
  10 LET z$="PRESS ANY KEY TO STOP THIS DEMON
STRATION.  TO FIND THE CODE OF THE KEY PRESSE
D PEEK 23560. "
```

Lines 5-10 Place the message (given in quotes) in the array, z$.

```
  20 FOR N=1 TO LEN Z$
  30 POKE 59399+N,CODE Z$(N)
  40 NEXT N
```

Lines 20-40 POKE the message in z$ into locations 59399 onwards in memory.

```
  50 POKE N+59399,0
  60 RANDOMIZE USR 60000
```

Lines 50-60 POKE the value '0' at the end of the message in z$ and call the routine.

```
  70 PRINT "YOU PRESSED THE KEY WITH CODE   "
;PEEK 23560;" TO EXIT THE MACHINE CODE"
```

Line 70 Prints the code of the key pressed.

This program allows you to test the routine, providing a message in z$ which will be scrolled on the 23rd line of the screen display once the program is RUN. This program can also be used as a subroutine in your own programming efforts. 16K owners should read the text for instructions on how to manipulate this program for their machines.

TIPS FOR THE TOP

BY GAVIN MONK

Contributions to *Program Power* have been arriving at a steady rate over the Summer months and the quality has improved considerably since my few suggestions in issue 3.

What I'm doing this month is looking through all of the listings we've published in *YS* so far, picking out the good bits, adding a few little extras of my own — and presenting you with a series of nine routines. The REM statements may, of course, be omitted, but personally I'd suggest that you leave them in.

The routines use lines 1-30 and lines 8000-9999 — which should still leave you plenty of room for your own program. They offer the following facilities: flashy border, happy tune, UDG generator, display lives, end of game/high score, string input editor, case converter, user-defined keys and valid answer checker. You'll find a good explanation of each routine as it's listed in the following pages. The best thing to do is to type the whole program in and then, using the annotations for each routine, play around with each section until you understand how each one works.

```
   1 REM ***********************
   2 REM *    Hints & Routines   *
   3 REM *    For Your Programs *
   4 REM *    By Gavin B Monk    *
   5 REM ***********************
   6 GO TO 30: REM jump past flashy bit
```

Lines 1-6 Cause a jump past the 'flashy border' routine so that the command RUN will still your program in motion.

```
   7 REM ***********************
   8 REM Flashy Spectrum Border Routine
   9 REM ***********************
  10 BORDER 2: BORDER 6: BORDER 4: BORDER 5:
BORDER 7: PAUSE 1: IF INKEY$="" THEN  GO TO 1
0
  20 RETURN
```

Lines 7-20 This routine is placed at the start of the program to ensure it runs fast and produces a steady display. Called by GO SUB 10, this routine will cause a spectrum of stripes to be displayed across the top half of the border, while waiting for a key press. When you leave the routine, the border colour will revert to white. The PAUSE 1 statement matches the program speed with the TV scan.

```
  30 REM ***********************
  31 REM Your Program Here
```

Lines 30-31 You've got lines 30-7996 to write your own program — all you have to do is call the relevant routine you need to spice up the proceedings.

```
7997 REM ***********************
7998 REM Tune for extra life, new level, new
high score etc.
7999 REM ***********************
8000 RESTORE 8050: REM point to tune data
8010 FOR i=1 TO 8: REM number of notes
8020 READ t,n: REM read time and note
8030 BEEP t,n: REM play note
8040 NEXT i: REM repeat
8050 DATA 0.1,11,0.1,11,0.8,16,0.05,11,0.05,1
6,0.05,11,0.05,16,1,20: REM tune data
8060 RETURN
```

Lines 7997-8060 Use the 'happy tune' routine when you want to give a reward for good play . . . perhaps to signal a new high score, extra life or a switch to a new level. The routine produces an eight-note tune from the data in line 8050. You can call it by GO SUB 8000; note that it uses the variables 'i', 't' and 'n'.

```
8097 REM ***********************
8098 REM UDG generator
8099 REM ***********************
8100 RESTORE 8150: REM point to data
8110 FOR i=USR "a" TO USR "u"+7: REM loop for
 all UDG s if less than 21 are required chang
e 'u  see text
8120 READ z: REM read data
8130 POKE i,z: REM poke data
8140 NEXT i
8150 RETURN
```

Lines 8097-8150 This routine provides a simple user-defined graphics generator. First plan your UDG graphics, either on graph paper or with a suitable software package, and then make a note of the values as detailed in the Spectrum manual. Now change the 'u' in line 8110 so that only the number of graphics required will be set up — for instance, 'd' will allow graphics a-d to be defined. Place the data for each character in lines 8160-8180 and, to set up the UDGs, call the routine with GO SUB 8100.

```
8159 REM data for UDG's here - 8 numbers for
every UDG used
8160 DATA 0,255,0,255,0,255,0,255: REM exampl
e data for 'a'
8161 REM data for 'b' here
8162 REM data for 'c' here
8163 REM data for 'd' here
8164 REM data for 'e' here
8165 REM data for 'f' here
8166 REM data for 'g' here
8167 REM data for 'h' here
```

```
8168 REM data for 'i' here
8169 REM data for 'j' here
8170 REM data for 'k' here
8171 REM data for 'l' here
8172 REM data for 'm' here
8173 REM data for 'n' here
8174 REM data for 'o' here
8175 REM data for 'p' here
8176 REM data for 'q' here
8177 REM data for 'r' here
8178 REM data for 's' here
8179 REM data for 't' here
8180 REM data for 'u' here
```

Lines 8159-8180 These lines have been set aside for you to allocate the data you'll need to define each of the UDGs in your program.

```
8197 REM ************************
8198 REM print remaining lives
8199 REM ************************
8200 PRINT AT y,x;"AAAAAA"( TO li): REM A=UDG
 representing players character, li=lives rem
aining, in this case max lives=6
8210 RETURN
```

Lines 8197-8210 String handling on the Spectrum is very different to that found on all non-Sinclair inpedimentia, but did you know that items inside quotes in PRINT statements can also be sliced? 'What use is this?', I hear you wonder. Well, if you define a UDG character to represent your playing character, then you can quite easily have a string of characters displaying the number of lives anywhere on the screen. Set 'x' and 'y' to represent the co-ordinates of the screen position required and let 'li' equal the number of lives. Now, call the routine with GO SUB 8200 and you'll find that the remaining number of lives will be printed up on-screen in the form of a row of player characters — Pacmen, for example.

```
8297 REM ************************
8298 REM end game/high score routine
8299 REM ************************
8300 REM game over--requires the following va
riables sc=score, HS=high score & returns the
 high score name in h$
8310 PRINT  FLASH 1; INK 6; PAPER 2;AT 10,12;
"GAME OVER"
8320 FOR i=1 TO 400: NEXT i: REM wait loop
8330 IF sc<=hs  THEN  RETURN : REM return if
not new high score
8340 PRINT AT 10,9; BRIGHT 1;"NEW HIGH SCORE"
8350 FOR j=1 TO 3: GO SUB 8000: NEXT j: REM p
lay tune or just a wait loop as line 8320 if
required
8360 LET hs=sc: REM update high score
8370 CLS : PRINT '''" Well Done That Was Fant
astic": REM or whatever
8380 PRINT AT 19,0;"Please enter your name."
8390 GO SUB 8500: REM editor
8400 IF LEN a$>5 THEN  GO TO 8380: REM check
name length
8410 LET h$=a$: REM update high score name
8420 RETURN : REM or rerun game
```

Lines 8297-8420 This very handy routine is all that's needed to convey the sad message: "I'm sorry but your game is over". It also requires the input string editor (see the next routine), the 'happy tune' routine, and variables 'sc' (score) and 'hs' (high score) to be set. The routine is called by GO SUB 8300, and on return from the routine the high score name will be stored in h$. The maximum name length is set to five characters in line 8400, but this can be adjusted to suit.

```
8497 REM ************************
8498 REM string input editor
8499 REM ************************
8500 PRINT AT 21,0;"
       ": REM clear input line
8510 LET a$="": REM zero input string
8520 PRINT AT 21,0;: REM set print position
8530 PRINT  FLASH 1;" ";CHR$ 8;: REM print cu
rsor & place print position on it
8540 PAUSE 1: PAUSE 0: REM wait for key press
8550 LET k$=INKEY$: REM k$=key pressed
8560 LET co=CODE k$: REM co=code of key press
ed
8570 IF co=13 THEN  GO TO 8630: REM check for
 enter
8580 IF co=12 THEN  GO TO 8650: REM check for
 delete
8590 IF co<32 OR co>127 THEN  GO TO 8540: REM
 if not a valid character then get another
8600 IF LEN a$<>32 THEN  PRINT k$;: LET a$=a$
+k$: REM if input not full print character &
add it to input string
```

```
8610 IF LEN a$=32 THEN  GO TO 8540: REM if in
put full get next character without printing,
cursor
8620 GO TO 8530: REM get next character
8629 REM enter pressed
8630 PRINT AT 21,0;"
     ": REM clear input line
8640 RETURN
8649 REM delete pressed
8650 IF a$="" THEN  GO TO 8540: REM if nothin
g to delete get next character
8660 LET a$=a$( TO LEN a$-1): REM delete char
acter from input string
8670 IF LEN a$<>31 THEN  PRINT " ";CHR$ 8;: R
EM if input not full delete cursor
8680 PRINT CHR$ 8;" ";CHR$ 8;: REM remove las
t character
8690 GO TO 8530: REM get next character
```

Lines 8497-8690 If you've ever wanted to get rid of those keywords and punctuation marks accepted by the INPUT statement, then this one's for you. This input string editor allows screen line 21 to be used for alphabetical inputs of up to 32 characters. The input is checked that it doesn't contain keywords and all the other yuck that the normal INPUT accepts. The routine is quite long and you must note that it uses a$ (stores input), k$ (stores the key pressed) and 'co' (code of the key pressed). It all works by checking the code of the key pressed to see if it's in the required range; if it's the Enter or Delete key, then the appropriate jump is made to a routine which adds the key to the entry, stops the input or deletes the key from the input. This routine should be especially useful for adventure programmers.

```
8697 REM ************************
8698 REM case conversions
8699 REM ************************
8700 REM converts a$ to upper case
8710 FOR i=1 TO LEN a$: REM loop for string l
ength
8720 LET co=CODE a$(i): REM co=ascii code of
a$(i)
8730 IF co>=97 AND co<=122 THEN  LET a$(i)=CH
R$ (co-32): REM if element lower case change
to upper case
8740 NEXT i: REM next element
8750 RETURN
8800 REM converts a$ to lower case
8810 FOR i=1 TO LEN a$: REM loop for string l
ength
8820 LET co=CODE a$(i): REM co=ascii code of
a$(i)
8830 IF co>=65 AND co<=90 THEN  LET a$(i)=CHR
$ (co+32): REM if element upper case change t
o lower case
8840 NEXT i: REM next element
8850 RETURN
```

Lines 8697-8850 Here's another routine for the adventure freaks out there who are worried about the Caps lock being switched on or off during an entry. Everybody, of course, knows that POKE 23658,8/0 turns it on or off respectively. The trouble is, doing this doesn't stop someone turning it off/on during a listing. The answer is to change the limits in line 8590 of the input routine above, or use this two-case converter routine. To convert a$ to upper case use GO SUB 8700 — to lower case, GO SUB 8800. Note that the variables used are 'i' and 'co'.

```
8897 REM ************************
8898 REM adding user defined keys to your gam
e
8899 REM ************************
8900 RESTORE 9130: READ nk: REM read number o
f keys
8910 LET m$="": REM reset movement string
8920 CLS : PRINT "  USER DEFINED KEYS-SELECT
NOW"'''
8930 FOR i=1 TO nk: REM loop for number of ke
ys
8940 LET m$=m$+CHR$ 0
8950 READ d$: REM read direction
8960 PRINT ''d$;: REM print direction
8970 FOR j=1 TO 16-LEN d$: REM loop for remai
nder of 1/2 screen line
8980 PRINT "-";
8990 NEXT j
9000 PRINT  FLASH 1;"?";CHR$ 8;: REM print ?
and move print position onto it
9010 PAUSE 1: PAUSE 0: REM wait for key press
9020 LET k$=INKEY$: REM get key press
9030 LET sel=0
9040 FOR j=1 TO LEN m$: REM scan for key alre
ady selected
9050 IF m$(j)=k$ THEN  LET sel=1: REM if sele
cted set flag
9060 NEXT j
9070 IF sel THEN  GO TO 9010
9080 LET m$(i)=k$
9090 PRINT k$: REM print key
9100 NEXT i
9110 PRINT £1;" Press any key to play the gam
e."
9120 FOR i=1 TO 10: NEXT i: GO TO 10: REM wai
t the flashy border
9130 DATA 5,"Left","Right","Up","Down","Fire"
```

Lines 8897-9130 Many commercial games now have a user-defined key option — the final solution to complaints about the control key layout. But here, another hidden benefit is that the Interface 2 and AGF joystick protocols can be used. This routine returns the keys selected in m$ (the movement string!) in the order given in the data statement at line 9130. The first digit in this statement is the number of keys required and the strings following this detail the purpose of each; checks are made to ensure the same key is not used twice. The following variables are used by the routine: nk (number of keys required); d$ (direction of required key); and k$ (key pressed). The 'flashy border' routine is also used so that a key press is waited for, once all the required keys have been entered. To add this feature to your game just GO SUB 8900. To check for movement in a game, all you now need is something rather like this:

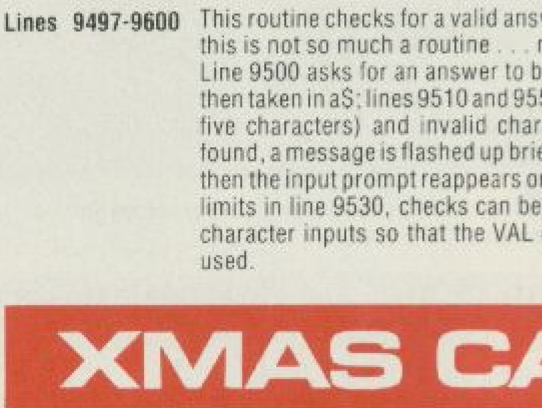
IF INKEY$=m$(3) THEN . . . . .: REM detects 'up' movement if using the given data

```
9497 REM ************************
9498 REM checking for a valid answer, e.g. on
ly
9499 REM ************************
9500 INPUT "Answer: "; LINE a$
9510 IF LEN a$>5 THEN  PRINT £1;"Answer is to
o long": GO SUB 9600: GO TO 9500: REM pause a
nd get answer again
9520 LET sel=0: FOR i=1 TO LEN a$: REM scan i
nput string
9530  IF (a$(i)<"a" OR a$(i)>"z") AND (a$(i)<
"A" OR a$(i)>"Z") THEN  LET sel=1: REM check
that each character is a letter and if not se
t flag
9540 NEXT i
9545 IF sel=1 THEN  PRINT £1;"Invalid Charact
er": GO SUB 9600: GO TO 9500
9550 STOP
9600 PAUSE 50: RETURN
```

Lines 9497-9600 This routine checks for a valid answer, but to be quite honest this is not so much a routine . . . more a collection of hints. Line 9500 asks for an answer to be input and this answer is then taken in a$; lines 9510 and 9550 check it for length (up to five characters) and invalid characters. If one of these is found, a message is flashed up briefly on the input line — and then the input prompt reappears once more. By changing the limits in line 9530, checks can be made against numeric or character inputs so that the VAL or VAL$ functions can be used.

XMAS CARD

BY TONY SAMUELS



This program generates a Christmassy scene on-screen, prints up our compliments of the season to all our readers in double-height characters and BEEPs a few of your favourite carols. To modify the message at the bottom of the screen, use the 'message-coder' routine given.

'Tis nearly Christmas . . . and I bet a lot of you out there haven't even given a thought to giving Grannie a Christmas card. Well, here's an idea from the author of Softek's *Ugh!* — why not send a computer-generated Christmas card with your own personalised message?

First, type in the main program as it stands and you'll get a personalised Christmas card from everyone here at *YS* — with accompanying Christmas carols. But once you've tired of our card to you, why not use the additional routine to place your own message in line 570 and wish all your friends a computerised 'Happy Christmas' on the day. All you have to do is RUN the 'message-coder' routine and input your required message, and then put the output data in place of the data we've put in line 570. Couldn't be simpler...

```
 10 INPUT "TYPE IN MESSAGE ................"
; LINE m$
 15 DIM m(LEN m$)
 20 FOR f=1 TO LEN m$
 30 LET c=CODE m$(f): LET m(f)=255-c+PEEK f
 40 NEXT f
 90 CLS : PRINT " DATA ";
 91 LPRINT " DATA ";
100 FOR f=1 TO LEN m$
110 PRINT m(f);",";
120 LPRINT m(f);",";
130 NEXT f
140 PRINT "999": LPRINT "999"
```

This routine allows you to insert your own Christmas message into the program. When you RUN the listing, you will be asked to insert your message — don't make it too long, otherwise you'll be *very* busy typing in all the data!

```
 10 CLEAR 32499: BORDER 0: PAPER 0: INK 0: C
LS : INK 7
```

Line 10 Clears space in memory for the machine code routine (at lines 550-560) and sets up the screen with the necessary colours.

```
 20 DATA 0,8,8,62,8,8,8,8: RESTORE : FOR f=0
 TO 7: READ z: POKE USR "t"+f,z: NEXT f
 30 DATA 0,0,0,0,1,0,0,0,0,2,64,0,0,0,16,0:
FOR f=0 TO 15: READ a: POKE USR "a"+f,a: NEXT
 f
```

Lines 20-30 Line 20 READs and then POKEs in the user-defined graphics data contained in line 30.

```
 40 LET a=50
 50 FOR f=0 TO 255
 60 PLOT f,0: DRAW 0,a
 70 LET a=a+INT (RND*3)-1
 80 IF a<32 THEN  LET a=32
 90 IF a>60 THEN  LET a=60
100 NEXT f
```

Lines 40-100 This routine draws a snowscape at random along the bottom part of the screen.

```
 110 FOR f=17 TO 14 STEP -1: PRINT AT f,23; P
APER 1;" ": NEXT f
```

Line 110 Draws the trunk of a Christmas tree.

```
 120 LET a=10: FOR f=180 TO 200: PLOT f,30: D
RAW 0,a: LET a=a+INT (RND*3)-1: NEXT f
```

Line 120 This line makes sure that there's some snow around the bottom of the tree trunk.

```
 130 INK 4: LET a=30: FOR f=64 TO 160: PLOT 1
88,f
 140 DRAW -a,0: DRAW a*2,0
 150 LET a=a-.3
 170 NEXT f
```

Lines 130-170 Draw the main part of the Christmas tree in position on the tree trunk.

```
 180 DATA 4,23,6,23,7,22,7,24,8,23,9,22,10,24
,11,21,11,25,12,23,13,22,13,25
 190 FOR f=0 TO 11: READ x,y: PRINT AT x,y; I
NK RND*6+1; PAPER 4;"b": NEXT f
```

Lines 180-190 Elaborate the tree with a few 'fairy lights'. Well, it's nearly Christmas after all!

```
 200 INK 6
 210 LET a=0: FOR f=175 TO 165 STEP -1: PLOT
30,f: DRAW -a,0: DRAW a*2,0: LET a=a+.25: NEX
T f: FOR f=164 TO 146 STEP -1: PLOT 30,f: DRA
W -a,0: DRAW 2*a,0: LET a=a-.16: NEXT f
 220 LET a=2.5: FOR f=1 TO 10: PLOT 30-f,165:
 DRAW 0,a: DRAW 0,-a*2: PLOT 30+f,165: DRAW 0
,a: DRAW 0,-a*2: LET a=a-.25: NEXT f
 230 PLOT 26,170: DRAW -5,5: PLOT 34,170: DRA
W 5,5: PLOT 25,160: DRAW -7,-13: PLOT 36,160:
 DRAW 7,-13
 240 PRINT AT 1,23;"t"
```

Lines 200-240 Position a star up in the left-hand corner of the screen.

```
 300 FOR f=0 TO 30
 310 LET x=INT (RND*32): LET y=INT (RND*12)
 320 IF ATTR (y,x)<>0 THEN  GO TO 310
 330 PRINT AT y,x; INK 7;"a"
 340 NEXT f
```

Lines 300-340 A few random stars are thrown in to make the whole effect more realistic.

```
 350 PRINT AT 19,0; INK 2; PAPER 7;"

         "
```

Line 350 This line clears an area of the bottom of the screen for a Christmassy-type message.

```
 360 RESTORE 550: FOR f=32500 TO 32571: READ
p: POKE f,p: NEXT f
```

Line 360 READs and POKEs the machine code data into the area created for it in memory by line 10.

```
 400 RESTORE 570: LET m$="": FOR f=1 TO 1000:
 READ m: IF m=999 THEN  GO TO 410
 405 LET m$=m$+CHR$ (255-(m-PEEK (f))): NEXT
f
 410 RESTORE 500: LET m$=m$+"       "
```

Lines 400-410 READ and POKE the message created by line 570.

```
 420 LET c=1
 430 LET c$=m$(c): PRINT AT 0,0; INK 0; PAPER
 0;c$: LET c=c+1
 440 IF c$="" THEN  GO TO 420
 450 READ b1,b2: IF b1=999 THEN  RESTORE 500:
 GO TO 450
 460 LET l=USR 32500: BEEP b1/4,b2
 470 GO TO 430
```

Lines 420-470 This routine READs the data from lines 500-540 and plays the Christmas carols that accompany the message as it scrolls from right to left across the bottom of the screen.

```
 500 DATA 1,7,1,7,1,7,1,9,1,7,1,7,2,2,1,4,1,2
,1,4,1,6,2,7,2,7,1,7,1,7,1,7,1,9,1,7,1,7,2,2,
1,4,1,2,1,4,1,6,2,7,2,7,1,14,1,12,1,11,1,9,1,
11,1,9,2,7,1,4,1,2,1,4,1,6,2,7,2,7,1,2,1,2,1,
4,1,6,1,7,1,7,2,9,1,14,1,12,1,11,1,9,2,7,2,12
,4,7
 510 DATA 1,11,.5,9,1,7,.5,4,.5,6,.5,7,.5,6,1
.5,4,1,11,.5,9,1,7,.5,4,.5,6,.5,7,.5,6,1.5,4,
1,7,.5,7,1,9,.5,9,1,11,.5,11,.5,14,.5,12,.5,1
1,.5,9,.5,11,.5,9,1,7,.5,6,3,4,1,6,.5,9,1,7,.
5,7,1,7,.5,2,1,7,.5,4,1.5,7,1,7,.5,7,1,7,.5,2
,1,7,.5,4,1.5,7,1,7,.5,7,1,9,.5,11,1,12,.5,11
,1,9,.5,11,1,7,.5,7,1,7,.5,2,1,7,.5,4,3,7
 520 DATA 1,7,1,12,.5,12,.5,14,.5,12,.5,11,1,
9,1,5,1,9,1,14,.5,14,.5,16,.5,14,.5,12,1,11,1
,7,1,11,1,16,.5,16,.5,17,.5,16,.5,14,1,12,1,9
,.5,7,.5,7,1,9,1,14,1,11,2,12
 530 DATA 1,7,1,12,1,12,1,12,2,11,1,11,1,12,1
,11,1,9,2,7,1,14,1,16,.5,12,.5,14,.5,16,.5,17
,1,19,1,7,.5,7,.5,7,1,9,1,14,1,11,2,12
 540 DATA 999,999
```

Lines 500-540 Contain the data for the Christmas carols. If you've an ear for music and find Tony's interpretations of all your favourite carols a little out of tune, this is the data you want to be looking to change.

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```
550 DATA 6,8,33,97,80,229,209,27,197,1,31,0,
237,176,1,225,0,9,193,16,240,6,8,33,129,80,22
9,209,27,197,1,31,0,237,176,1,225,0,9,193,16,
240
560 DATA 33,0,64,17,127,80,6,4,126,18,20,18,
20,36,16,248,235,1,224,7,237,66,235,123,254,1
59,40,234,201,0
```

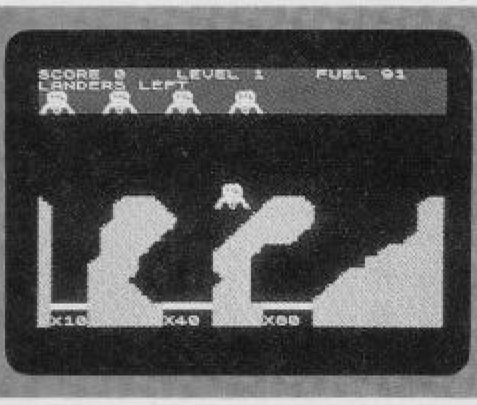
Lines 550-560 The machine code routine to run the program.

```
570 DATA 358,175,398,398,329,426,184,188,251
,232,257,248,233,168,213,418,415,165,407,466,
478,426,405,187,251,303,349,380,279,139,362,4
16,339,183,182,380,409,402,466,418,263,190,40
9,392,409,466,478,372,196,238,233,363,418,316
,167,400,452,223,270,239,182,257,330,315,314,
328,179,226,392,203,218,420,365,363,336,154,4
32,351,364,464,417,345,363,251,476,289,143,39
1,279,200,233,333,343,244,478,464,464,464,464
,478,999
```

Line 570 This line contains the coded message from all of us here at *YS* to you lot out there. To alter the message, type your own Christmas greeting into the 'message coder' routine and then type its output into this line and type RUN.

LUNAR BUGGY

BY ROBERT STOCKTON



Here we see the first screen from *Lunar Buggy*, in which you have to land the space craft into one of the three bays. This done, you've to guide your buggy across the lunar surface, avoiding the various pitfalls en route and sniping the nasties.

This is a fast-moving graphic game for the 48K Spectrum — and it's packed full of all sorts of surprises!

You start off attempting to land your space craft in one of three landing bays that have been created on the lunar surface. One of the bays is fairly easy to land in, the other two are much more difficult . . . but, of course, you get more points for making a successful landing! The controls you use are simple: just keys '9' and '0' to move left and right respectively and '1' to thrust the craft skywards. You're a fuel guage in the top right-hand corner of the screen, and the amount of fuel you've left once you have landed is used to calculate your score — so use it sparingly.

Once you've made a successful landing, your craft is transported beneath the landing bay and you get into a moon buggy and drive off across the moon's surface in search of another moon lander. Along the way you'll find all sorts of hazards that you'll have to jump over using the '1' key. Once you've reached your destination, you start all over again . . . only this time it's much harder. The only thoughtful device you now have once you've gone past level two is a laser gun mounted on your moon buggy — you'll need that to deal with the troublesome aliens.

Lunar Buggy is like the old *Moon Lander* games but incorporating the more modern *Moon Patrol* theme. Making use of 42 (count 'em!) user-defined graphics, the program is a treat to look at.

```
1 INK 7:PAPER 0:BORDER 0:GO TO 8700
```

Line 1 Sets up the initial screen attributes and jumps to set up the user-defined graphics and the 'instructions' routine.

```
10 LET S=0: LET BUGGY=4
20 LET LEV=1: LET LAND=0
50 INVERSE 0: PAPER 0: INK 7: BORDER 0: CLS
60 GO TO 7000
```

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Lines 10-60 Set up the initial variables and attributes for the moon lander part of the game, then jump to the routine containing the screen details.

```
100 REM SET UP LANDSCAPE
105 POKE 23675,88: POKE 23676,255
110 LET L$="iiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
jiiiiiiiiiiiiiijiiiiiiig          hiiiiiiiiiii
iiiiig   hiiiiiiiiijg          hiiiiiig       h
iiiiiiijiiiiiiiiiiiig    hiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiii"
120 LET M$="████████████████████████
██████████████████████████g        h████████████
███████████████████████g      h████████████████
█████████████████████████g  h███████████████████
██████████████████"
140 LET C=1: LET D=0
150 LET X=17: LET Y=5
180 LET F=0
182 LET LEV=LEV+1: BEEP .1,20: LET C=1
185 LET O$="
     qr     qr              qr              qr
   qr     qr        qr       qr               qr
              qr                qr
                      "
```

Lines 100-185 Set up details for the screen landscape for the buggy part of the game. The second bank of UDGs is used via the system variable 23675 (see lines 8700-8750).

```
500 REM SET UP SCREEN
505 INVERSE 0: INK 7: PAPER 0: BORDER 0
510 PRINT AT 21,0; INK 6;"██████████████████
████████████████"
520 PRINT AT 0,0; PAPER 2; INK 6;"SCORE ";S,
"LEVEL ";LEV,,,,,,
530 PRINT AT 1,0; PAPER 2;"BUGGYS LEFT
"
680 FOR A=1 TO BUGGY
690 PRINT  PAPER 2;AT 2,A*5-5;"abc  ";AT 3,A
*5-5;"def  "
700 NEXT A
```

Lines 500-700 Draw the screen containing the buggy part of the game, including the score, 'buggys left', etc.

```
1500 REM PRINT AND MOVE MAN&LAND
1510 LET CX=X: LET CY=Y
1515 IF LEV>2 THEN  PRINT AT 18,0; OVER 1; IN
K 8;O$(C TO C+31)
1520 PRINT  INK 6; PAPER 2;AT 19,0;L$(C TO C+
31);AT 20,0;M$(C TO C+31)
1530 LET Y=Y+(INKEY$="0" AND Y<14)-(INKEY$="9
" AND Y>1)
1540 IF INKEY$="1" AND D<>1 THEN  LET D=-1
1550 IF X<=17-(Y/2) THEN  LET D=1
1570 LET X=X+D
```

Lines 1500-1570 Variables CX and CY store the old buggy position. Lines 1515 and 1520 draw the land which is level-dependent; it gets much harder after the second level. Lines 1530 and 1540 read the keyboard and update variables X and Y, which store the buggy's position.

```
1700 PRINT AT CX,CY;"   ";AT CX+1,CY;"   ";AT
 X,Y; INK 4;"abc";AT X+1,Y; INK 5;"def"
```

Line 1700 Erases the old buggy and prints it in the new position.

```
1710 PRINT AT 0,6; INK 6; PAPER 2;S
1715 IF INKEY$="2" THEN  GO SUB 1760
1720 IF LEV>2 THEN  PRINT AT 18,0; OVER 1; IN
K 8;O$(C TO C+31)
1740 IF X=17 AND D=1 THEN  LET D=0: PRINT AT
CX,CY;"   ";AT CX+1,CY;"   ";AT X,Y; INK 4;"k
lm";AT X+1,Y; INK 5;"nop": BEEP .1,-40
1745 IF D=0 THEN  IF L$(C+Y)<>"i" OR L$(C+Y+2
)<>"i" THEN  GO TO 5000
1747 IF X=17 AND LEV>2 AND O$(Y+C+2)="q" THEN
  GO TO 5000
1749 IF X=15 AND LEV>2 THEN  IF O$(C+Y)="q" O
R O$(C+Y+2)="q" THEN  GO TO 5000
1750 LET C=C+1: IF C=LEN L$-31 THEN : PRINT A
T 0,22; PAPER 8;LEV: IF LEV/4=INT (LEV/4) THE
N  GO TO 8500
1751 IF C=LEN L$-31 THEN  GO TO 182
1752 GO TO 1500
```

Lines 1710-1752 Print the score and line 1715 checks for the buggy's gun being fired. Throughout this routine, if you've reached level three or over, a check is made to see if you've managed to hit the alien with a laser blast. A check is also made to see if your buggy has hit a hole in the track. If the level is a

multiple of four, that is 'level/4–INT(level/4) then a larger bonus is awarded. The routine then moves to line 1500 for the next move.

```
1755 REM FIRE A SHOT
1760 FOR A=Y+4 TO 30: PRINT AT X+1,A;" u"
1780 BEEP .001,60: IF O$(C+A)<>" " AND LEV>2
AND X=17 THEN LET S=S+10: LET O$(C+A TO C+A+
1)="  ": BEEP .1,-30: PRINT AT X+1,A;"   ": R
ETURN
1790 NEXT A
1800 PRINT AT X+1,31;" "
1810 RETURN
```

Lines 1755-1810 The routine to fire a shot from the buggy. This will only be of use after level two.

```
5000 REM LOSE A LIFE
5010 INVERSE 1: FOR a=24 TO 0 STEP -2: INK A/
4: BEEP .0005,a*2: PLOT y*8+a,(176-x*8)+8: DR
AW 0,-16: PLOT y*8,160-(x*8)+a: DRAW 24,0: NE
XT a: INVERSE 0: PRINT AT x,y;"   ";AT x+1,y;
"   ": INK 7
5020 LET C=1
5030 LET BUGGY=BUGGY-1
5040 IF BUGGY=0 THEN GO TO 6000
5050 PRINT PAPER 2;AT 2,BUGGY*5;"      ";AT 3
,BUGGY*5;"    "
5055 IF LAND=1 THEN RETURN
5060 GO TO 1500
```

Lines 5000-5060 This routine comes into play once you have lost a life. Line 5010 blows the moon lander/buggy to smithereens, line 5040 checks you've still some lives in hand, line 5050 rubs out the lander from your score, and lines 5055 and 5060 return you to the part of the game in which you lost your life.

```
6000 REM GAME OVER
6010 PRINT AT 10,12; PAPER 2;"GAME OVER": BEE
P 1,-30
6020 BEEP 1,-50
6030 PRINT AT 11,8;"PRESS A KEY TO PLAY";AT 1
3,6;"PRESS I FOR INSTRUCTIONS"
6040 IF INKEY$="" THEN GO TO 6040
6045 IF INKEY$="i" THEN GO TO 9000
6050 IF INKEY$<>"" THEN GO TO 6050
6060 RUN 3
```

Lines 6000-6060 The 'end of the game' routine. You'll be asked if you want to play again, and whether you want to see the instructions for play.

```
7000 REM LANDER
7005 POKE 23675,176: POKE 23676,254
7010 REM SET UP VARS
7020 LET X=4: LET Y=14
7030 LET V=.1: LET H=0
7040 LET FUEL=99
```

Lines 7000-7040 Set up the moon lander screen details. Line 7005 selects the first bank of UDG data.

```
7300 REM SET UP SCREEN
7310 PAPER 0: INK 7: BORDER 0
7320 CLS
7330 PRINT AT 0,0; PAPER 2;"SCORE ";S;"    LE
VEL ";LEV,AT 0,22;"FUEL ";FUEL,
7335 DIM A$(672)
7340 LET A$(311 TO )="               d      eaad
    eaad        eaa       aaaad       eaaaa
   aaa    eaaaab     eaaaab        aaa     aa
aab     eaaaab       eaaa    aaab     eaab
      eaaaaa   eaaaa        aaa         aaaaaaa
  aaab       caa        eaaaaaaaa    aaad
eaa       eaaaaaaaaa    aaaad       aaa       eaaaa
aaaaaa■■■aaaaaa■■■■aaaa■■■■aaaaaaaaaaaX10aaaa
aaX40 aaaaX80 aaaaaaaaaa"
7350 PRINT AT 1,0;A$
```

Lines 7300-7350 Draw the screen. Lines 7335 and 7340 dimension aS to the size of the screen minus the top line (21 x 32 = 672). The screen is then filled with characters from element 311 onwards and, finally, aS is printed.

```
7355 PRINT PAPER 2;AT 1,0;"LANDERS LEFT",,
7360 FOR A=1 TO BUGGY
7370 PRINT PAPER 2;AT 2,A*5-5;"fgh  ",AT 3,A
*5-5;"ijk  ",
7380 NEXT A
```

Lines 7355-7380 Print the number of moon landers left as the actual characters used are two by three in size.

```
7500 REM PRINT AND MOVE LANDER
7510 LET CX=X: LET CY=Y
7520 LET V=V-((INKEY$="1" AND X>2)/10)
7525 IF V<.2 THEN LET V=V+LEV*2/100
7530 LET H=H+((INKEY$="0")/10)-((INKEY$="9")/
10)
7550 IF Y>0 AND Y<29 THEN LET Y=Y+H
7552 IF Y<=0 THEN LET Y=1: LET H=0
7553 IF Y>=29 THEN LET Y=28: LET H=0
7555 LET X=X+V
7556 IF X<4 THEN LET X=4: LET V=.1
```

Lines 7500-7556 Variables CX and CY are used to contain the last position of the moon lander. The keyboard is then read and note is taken of the increase/decrease of the XY position and the change in velocity (V).

```
7570 PRINT AT CX,CY;"   ";AT CX+1,CY;"   ";AT
X,Y;"fgh";AT X+1,Y;"ijk"
7575 LET FUEL=FUEL-.25: PRINT PAPER 2;AT 0,2
7;INT FUEL;"  "
```

Lines 7570-7575 Erase the old moon lander and print it in its new position.

```
7580 LET B$=A$((INT (X))*32+INT (Y+1) TO (INT
 (X))*32+INT (Y+3))+A$(INT (X+1)*32+INT (Y+1)
 TO INT (X+1)*32+INT (Y+3))
7590 IF B$="      " THEN GO TO 7500
7600 IF B$<>"   ■■■" THEN LET LAND=1: GO SUB
 5000: LET LAND=0: GO TO 7000
```

Lines 7580-7600 Check if there's been a crash, or whether you've managed to land the moon lander successfully. If you've crashed then GO SUB 5000, if not the routine GO SUBs to line 7000.

```
7610 IF Y=1 THEN LET B=10
7620 IF Y>8 AND Y<14 THEN LET B=20
7630 IF Y>17 THEN LET B=30
7800 REM BONUS
7810 LET X$="BONUS = "+STR$ INT FUEL+" X "+ST
R$ B
7820 FOR A=1 TO LEN X$
7830 PRINT AT 5,5+A;X$(A)
7840 BEEP .01,30
7850 NEXT A
7860 LET S=S+INT (B*FUEL)
7870 PRINT AT 0,6; PAPER 2;S
```

Lines 7610-7870 Calculate and print the bonus details — of course, this does rather depend on the landing position and how much fuel you've got left in the tank.

```
7875 BEEP .1,40: FOR A=1 TO 100: NEXT A
7877 PRINT AT 21,0;"a ■ aaaaaa ■ aaaa ■ aaa
aaaaaaa"
7878 PRINT AT 20,0;"a■■■aaaaaa■■■aaaa■■■aaa
aaaaaaa"
7895 REM LANDED
8000 FOR A=1 TO 11
8010 RANDOMIZE USR 3582
8020 PRINT AT 21,0;"a ■ aaaaaa ■ aaaa ■ aaa
aaaaaaa"
8022 NEXT A
8025 RANDOMIZE USR 3582
8026 PRINT AT 21,0;"a ■ caaaab ■ caab ■ caa
aaaaaaa"
8030 FOR A=1 TO 6
8040 PRINT AT 21,0;"a ■           ■         ■
     "; INK 1;"■"
8045 RANDOMIZE USR 3582
8050 NEXT A
8060 PRINT AT 21,0;"aa■aaaaaaaa■aaaaaa■aaaa
aaaaaaa"
```

Lines 7875-8060 The moon lander has landed, so the underneath of the landing bay is printed up on-screen. This is done using a call to 3582 of the ROM which scrolls the screen and attributes up one whole screen line.

```
8070 POKE 23675,88: POKE 23676,255: PRINT AT
19,22;"abc";AT 20,22;"def": POKE 23675,176: P
OKE 23676,254
```

Line 8070 Prints the buggy from the second bank of UDG data.

```
8090 FOR A=0 TO 18
8100 IF B=10 THEN PRINT AT A,1;"   ";AT A+1,
1;"fgh";AT A+2,1;"ijk";AT A+3,1;"■■■"
8110 IF B=20 THEN PRINT AT A,10;"    ";AT A+
1,10;"fgh ";AT A+2,10;"ijk ";AT A+3,10;"■■■"
8120 IF B=30 THEN PRINT AT A,18;"    ";AT A+
1,18;"fgh ";AT A+2,18;"ijk ";AT A+3,18;"■■■"
8130 BEEP .1,A
8140 NEXT A
```

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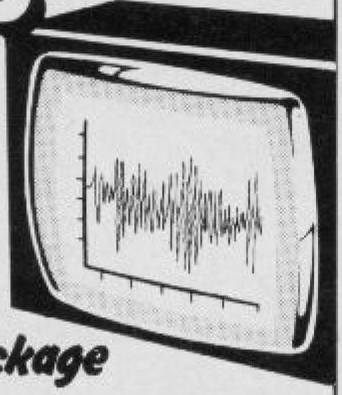
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Lines 8090-8140 Cause the moon lander to move down 18 lines of screen, one at a time, until it reaches the bottom.

```
8170 POKE 23675,88: POKE 23676,255
8190 FOR A=20 TO 15 STEP -1
8200 PRINT AT A,31;" "
8210 BEEP .1,1
8220 NEXT A
8230 FOR A=21 TO 28
8240 PRINT AT 19,A;" abc";AT 20,A;" def"
8245 BEEP .01,20
8250 NEXT A
8260 CLS
8270 GO TO 100
```

Lines 8170-8270 This routine moves the buggy across the screen into the moon buggy position at line 100.

```
8500 REM BLAST OFF
8510 POKE 23675,176: POKE 23676,254
8520 PRINT AT 17,27;"fgh";AT 18,27;"ijk"
8560 PRINT AT 10,10; INK 2;"BONUS = 5000": BE
EP 1,30
8565 LET S=S+5000
8566 FOR A=1 TO 50: NEXT A
8570 FOR A=16 TO 3 STEP -1
8580 PRINT  INK 8; PAPER 8;AT A,27;"fgh";AT A
+1,27;"ijk";AT A+2,27;"   "
8585 BEEP .01,2
8590 NEXT A
8595 CLS
8600 GO TO 7000
```

Lines 8500-8600 The routine to blast the moon lander off into space.

```
8700 REM SET UP UDG'S
8710 RESTORE 8800: CLEAR 65199
8715 PRINT AT 10,10;"PLEASE WAIT"
8720 FOR A=65200 TO 65535
8730 READ X: POKE A,X: BEEP .001,RND*20
8740 NEXT A
8750 GO TO 9000
```

Lines 8700-8750 Set up the UDGs. Note that this is different to the normal method as 42 characters have been defined — twice as many as you would normally expect. These are addressed as two banks of 21 UDGs by changing the system variable UDG(23675). Line 8750 just causes a jump past the data and isn't usually required.

```
8800 DATA 85,170,85,170,85,170,85,170,85,170,
84,168,84,168,64,128,85,170,85,10,5,10,5,0,64
,128,64,168,84,168,85,170,1,2,5,42,21,170,85,
170,0,1,3,3,3,3,3,1,171,255,117,37,85,116,255
,255,0,128,192,192,192,64,192,128,3,7,15,30,2
4,56,40,80,85,255,255,165,90,36,36,24,192,224
,240,112,24,28,20,10,0,0,64,224,248,134,177,2
33,0,0,0,0
8810 DATA 0,32,159,96,213,127,255,224,79,31,5
7,127,179,255,255,124,41,187,131,199,24,252,2
54,15,230,240,60,254,0,0,3,6,15,30,21,58,0,0,
192,224,112,184,220,172,53,123,119,234,221,17
1,223,255,94,174,126,174,247,107,255,255,207,
0,0,0,0,0,0,0,194,199,143,154,181,234,213,127
,64,224,248,134,177,233,179,255,0,0,0,32,159,
96,24,252,255,224,207,223,217,25,31,15
8820 DATA 255,108,57,171,187,131,131,1,254,15
,231,247,54,52,240,224,128,192,192,224,240,25
2,254,255,1,3,3,7,15,63,127,255,157,255,255,2
55,255,255,255,255,129,195,227,231,231,247,25
5,255,0,0,194,199,143,154,181,234,0,0,64,224,
248,134,177,233,0,0,0,0,0,32,159,96,213,127,2
55,224,79,31,57,127,179,255,255,124,41,187,13
1,199,24,252,254,15,230,240,60,254,0,0,3,6
8830 DATA 15,30,21,58,0,0,192,224,112,184,220
,172,53,123,119,234,221,171,223,255,94,174,12
6,174,247,107,255,255,207,0,0,0,0,0,0,0
```

Lines 8800-8830 Comprise the data for the two sets of UDGs. It may seem a lot of data to pump in . . . but the results are well worth it!

```
9000 REM INSTRUCTIONS
9010 PAPER 0: INK 0: BORDER 1: CLS
9020 PRINT TAB 10;"LUNER BUGGY"
9030 PRINT  OVER 1;AT 0,10;"___________"
9040 PRINT '"PROGRAM BY ROBERT STOCKTON"
9050 PRINT '"BUGGY UGG'S BY ANDRE TABRIZIFAR"
9060 PRINT ''"The object is to first land you
r moon lander and get to your moonbuggy.Then y
ou have to get to   the next moon lander in y
our      luner buggy."
9070 PRINT ''"To do this use keys-"
9080 PRINT "9-Left    0-Right"
9090 PRINT "1-Thrust or jump"
9100 PRINT "2-Fire(only the buggy has a gun)T
he buggy jumps higher the       further forwar
d you are."
9110 PRINT "Good Luck Press a key to play"
```

Lines 9000-9110 Print the instructions using black INK and black PAPER. (If that seems a bit silly, check out the next routine — it really does make sense!)

```
9120 FOR a=175 TO 0 STEP -1
9130 PLOT 0,a: DRAW  OVER 1; PAPER 7;255,0
9140 NEXT a
```

Lines 9120-9140 This routine draws white lines 'OVER' the whole screen — thus, the instructions are made to materialise as if by magic.

```
9150 IF INKEY$="" THEN  GO TO 9150
9160 IF INKEY$<>"" THEN  GO TO 9160
9170 GO TO 2
```

Lines 9150-9170 Wait for a key to be pressed.

PROGRAMMING ON SPEC

Programs submitted for publication in *Your Spectrum* have a tendency to suffer a number of common faults — simple little quirks which can be rectified easily.

Our major gripe is that the display is often messy and untidy. A screen can be made so much more legible if it is well-formatted — if spaces are left between lines of text and words are not split from line to line. And while we're on about screens, if you display something like the current score or whatever, do remember that labelling it makes all the difference — the whole effect becomes more user-friendly (to use a rather hackneyed phrase). Other suggestions for improvements are:

1. Use the 'PRINT #1;' statement to allow you to print on the bottom two lines of the screen.
2. Use INKEY$ for simple inputs which only require a single key response.
3. Check that answers to any questions within a program are valid.
4. If long calculations are carried out within the program's operation don't let the user sit there idly twiddling thumbs, print a message such as 'please wait — I'm thinking'. Or even better, give the user something to read, such as the instructions for playing the game, while the calculation is being undertaken.
5. Write major sections of your program as subroutines, and label them with REM statements explaining what they all do. It is always useful to place a REM statement after a GO SUB call, for instance.
6. If your program is written in machine code, or contains a machine code routine, then provide a checksum for the data so that the unwary typist will realise their mistake before it's too late. An Assembly listing accompanying the code would also be useful.
7. Write your listings in as structured a form as you can manage, as this will help other programmers to improve and/or modify them.

Above all, think of all the annoying aspects of listings you've experienced in your programming career — and make sure they don't happen in your programs. That said, the standard of contributions to *Your Spectrum* have been extremely high. So, if you want to see your name *YS*, then we want to see your programs — remember, we pay better than most, but they've got to be good! YS

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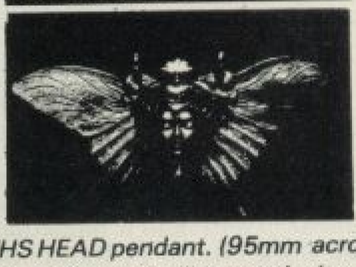
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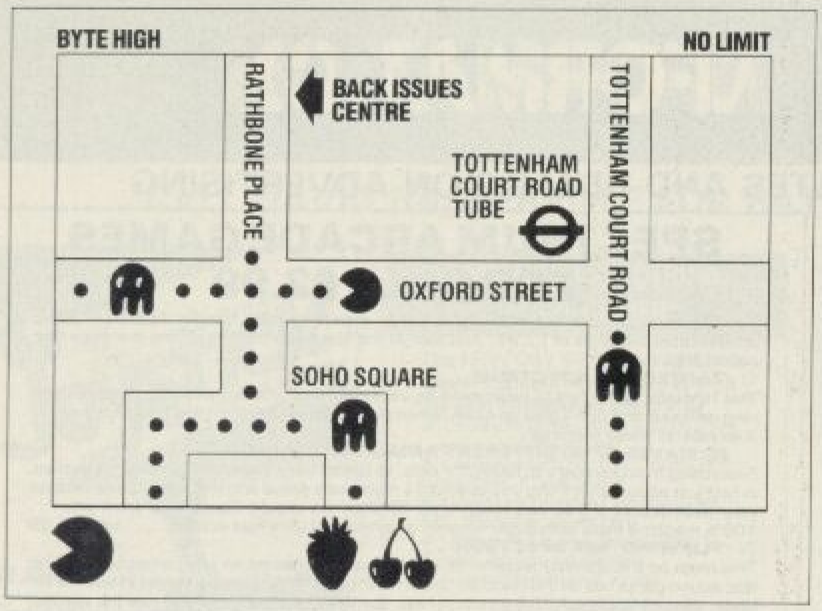
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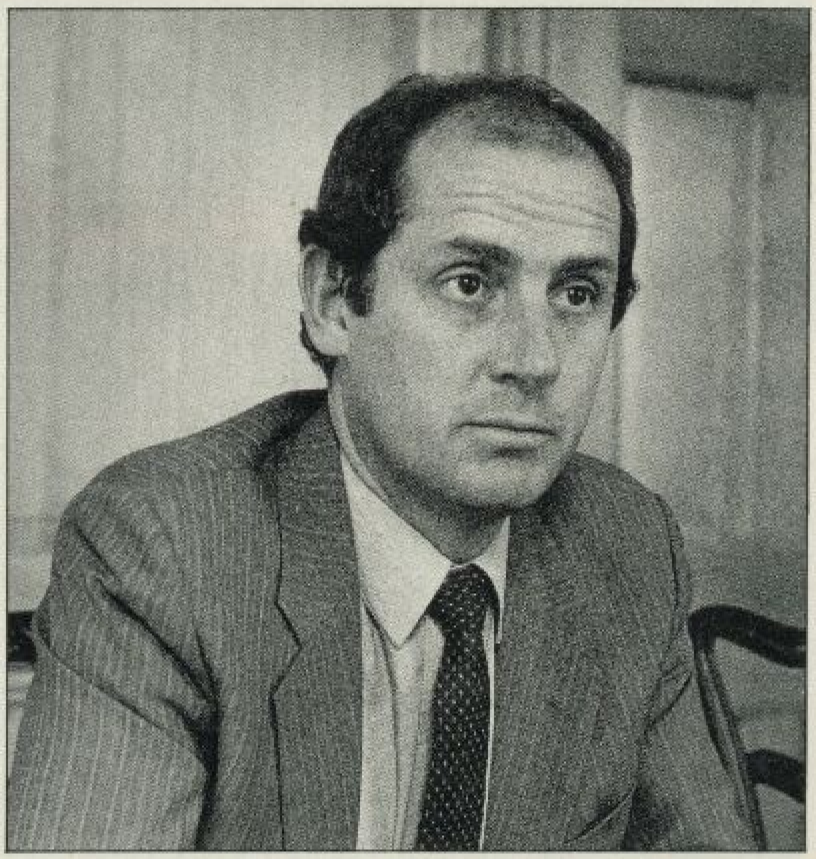
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THE SECRET THAT WAS SPECTRUM+

A SUE DENHAM EXCLUSIVE!

Just days after the launch, Sinclair Research's MD** Nigel Searle **explains the thinking that's gone into the ZX Spectrum+.

Pulling the wool over the computing industry's eyes isn't the easiest of tasks, but Sinclair Research seems to have managed just that over the past four months. Indeed, they may have given many magazine editors a justifiable opportunity to dredge up that old chestnut, 'hold the front page!'.

So, how did the news of the new machine remain so secret? "Well, for a start, it's amazing that it did stay so quiet for so long. A couple of weeks before the Spectrum+ was announced, one of our staff — I won't name names as I wouldn't want to embarrass him — left a whole load of promotional material in the back of a taxi.

"Another lucky break was the codename we chose for the Spectrum+ project. The chief designer of the machine was a Ford Thunderbird fanatic — so the in-house codename was 'TB'. Of course, if you were discussing the project and an outsider started listening in, it was easy enough to turn the conversation into one on TV!"

Moving on to the initial plans for the Spectrum+, how would you counter criticisms that it's not the upgrade everyone was hoping for? "We first started talking about the Spectrum+ back in June, although when the original Spectrum was launched we were very careful not to date its name — even though its in-house working title was the ZX82. The Spectrum is strong enough in the games market, but we were keen to upgrade it for 'adult' users — and that meant adding a proper keyboard.

"As for including the two interface devices and possibly a Microdrive into the design — yes, it's something we thought of. The reason we didn't do it was twofold — to begin with, our research showed us that sales of Interfaces 1 and 2 were comparatively small and it didn't seem commercial sense to offer a more expensive machine that only 25 per cent of users wanted. Our company also has to consider the price war that'll happen — just as it did in the States — and it's important we can match the competitiveness of other home micros in the market.

"It's also a matter of production. At the moment, we're producing something like 200,000 Spectrum boards a month — but it's at a relatively late stage in development that we actually have to say whether it will turn out as a Spectrum+. As far as we can tell at the moment, the Spectrum+ seems to be outselling the Spectrum about two to one . . . but it's early days yet.

"Obviously, once we've turned production purely to the Spectrum+ — or rather, I should add, *if* we turn production solely in that direction — we will have the opportunity to make alterations to the basic design and incorporate other features, such as a built-in Microdrive, Interface 1 and joystick port."

Steering the subject back to the gaffe about the Spectrum+ production, how long can we expect to see the Spectrum gracing the high street shelves, and what, pray, has happened to the 16K Spectrum? "Let me first say that there are no definite plans to stop manufacturing Spectrums. I forsee the Spectrum being in the market just as long as software houses keep writing *good* software for it. As far as the 16K version is concerned, it's still available from us — but the retailers don't want to distribute it through the shops. Computer users in this country want the extra 32K memory, especially as most of the software is written for the 48K machine. Of course, overseas sales are a different matter entirely — for example, we had an order from France the other day for 19,000 ZX81s; I couldn't sell 19 in the UK!"

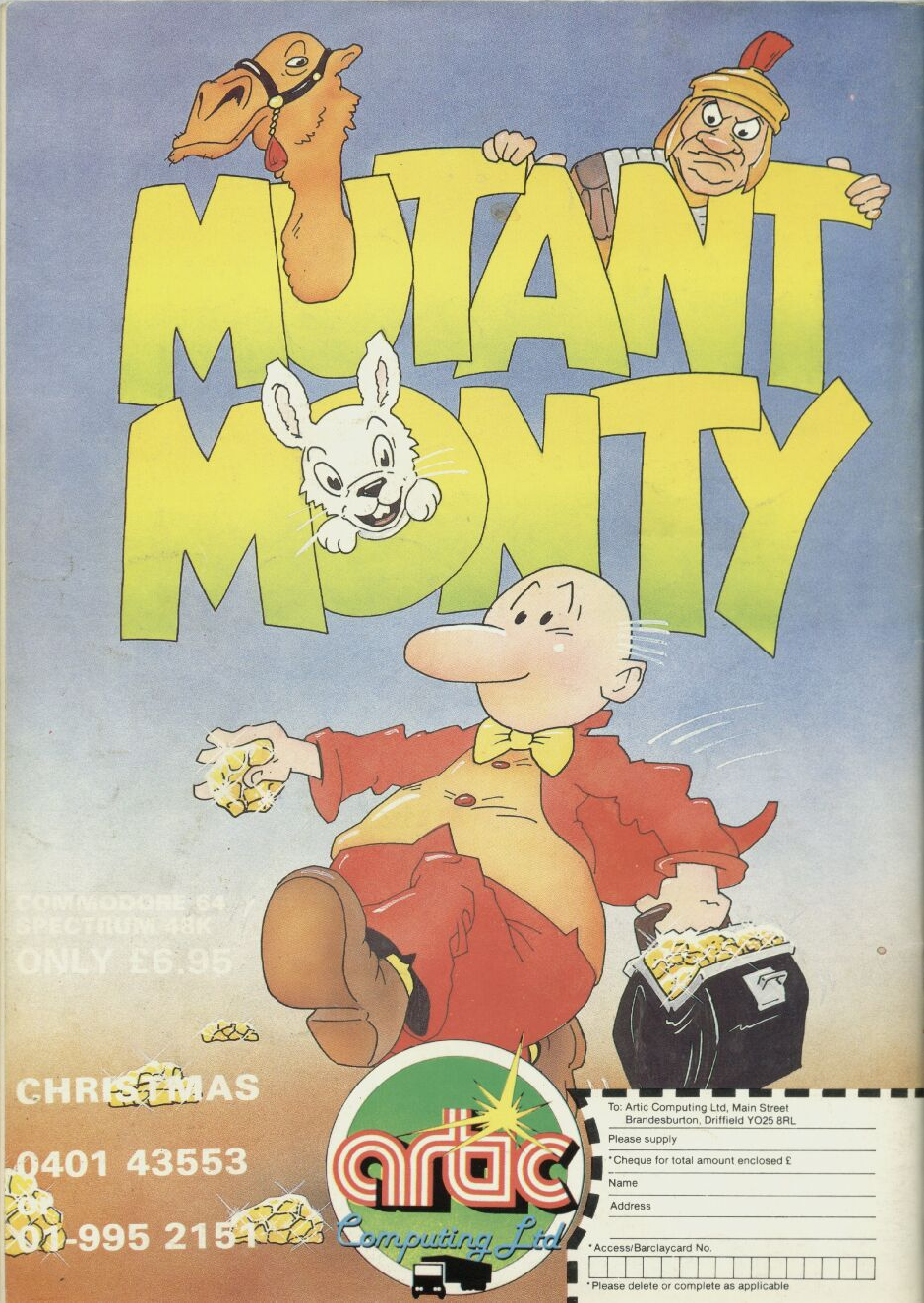
What's the industry reaction been to the Spectrum+? "I can't imagine that the add-on keyboard manufacturers are very happy. I doubt the Spectrum+ will affect their sales in the near future — there are too many Spectrums around — but long-term sales must look pretty bleak. One thing we're thinking of doing is to allow hardware manufacturers to buy empty Spectrum+ cases from us and then offer an upgrading service for Spectrum users.

"As you know, our company has been giving software away with our computers. That idea came from Clive who, on hearing any notion that's half-sensible, has a knack of coming up with a way of making it work, however outrageous the original suggestion. I thought we'd have a lot of people after our blood, especially chain stores like WH Smiths who've shelves full of the same product for sales that we're *giving* away. However, everyone was very reasonable — I suppose no-one loses out."

And what of the future? "We're now in a position to offer two competitive machines in the home market and, of course, the QL in the business market. In the future, we'll be using the 'ZX' as the logo for our home computers and 'QL' for . . . err, machines other than home computers."

On a final note, what would the managing director of Sinclair Research like for a Christmas present? "What I'd really like to have is the name of the person who sabotaged my chair at the QL launch. Sitting in my cushioned chair, waiting for Clive to finish his introduction so that I could kick off the proceedings, I became aware that the chair was absolutely soaked. Someone had filled the cushioning with a few gallons of water so that it looked perfectly alright before you sat in it — but as soon as you did . . . well, need I say more? When I stood up to make my speech, I had rivers of water pouring down my legs. Just give me his name, that's all, and I'll be a happy man over Christmas." YS

Editor Roger Munford; **Deputy Editor** Tina Boylan; **Technical Editor** Peter Shaw; **Editorial Consultant** Andrew Pennell; **Software Consultant** Gavin Monk; **Contributors** John Torofex, Tony Samuels, Trevor Marchant, Ross Holman, Dave Nicholls, Roger Willis, Ian Beardsmore, Martin Evans, Robert Stockton, Max Phillips, Terry Bulfib, Mike Leaman, Toni Baker; **Art Editor** Hazel Bennington; **Art Assistant** Steve Broadhurst; **Group Advertising Manager** Jill Harris; **Advertising** David Baskerville; **Typesetters** Carlinpoint; **Group Art Director** Perry Neville; **Publisher** Stephen England; **Published by** Sportscene Specialist Press Ltd, 14 Rathbone Place, London W1P 1ED. **Telephone (all departments)** 01-631 1433. **Telex** 8954139 BunchG. **Reproduction** Graphic Ideas, London; **Printed by** Chase Web Offset, St Austell, Cornwall; **Distribution** Seymour Press, 334 Brixton Road, London SW9. Telephone 01-733 4444. *Your Spectrum* is a monthly publication.


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